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AND

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No. 10.—*January*, 1836.

I.—*Analysis of the residuum of fired Gunpowder.*

The nature and quantity of the solid products of Gunpowder after explosion, as given in some scientific works, appearing to me to be unsatisfactory, I had occasion lately to attempt the determination of the point by analysis.

2.—The residuum analysed was obtained from the Madras Powder Mills; and was collected from an 8-inch iron mortar, after firings of two ounce charges, the composition of the powder being—

Saltpetre.........	75	parts
Charcoal,.........	$13\frac{1}{3}$	,,
Sulphur,..........	$11\frac{2}{3}$	,,
	100	

3.—Several ounces having been procured, two or three preparatory trials were made, which came out very discordant; it occurred from some parts of the substance being alkaline, and some appearing to consist chiefly of charcoal, incombustible, and other matter. The remainder was afterwards pounded and mixed together, and the subsequent trials resulted more uniform: but in order to ensure success, the intermixture of the whole quantity ought in the first place to be made very intimate and complete, otherwise a great discrepancy occurs by operating on separate parcels though they may be taken out of one common stock.

EXAMINATION AS TO QUALITY.

4.—Submitted to the spirit-blow-pipe some portions of the residuum, before mixing, burnt quietly on red hot charcoal and fused without the smell of sulphur; and some portions appeared to deflagrate slightly. After being well mixed, crepitation occurred on red hot charcoal before the common blow-pipe, but no appearance of deflagration.

5.—A sample was dissolved in cold distilled water, filtered, and a clear solution obtained. Sundry tests were applied, and gave indications, as follows, viz:

6.—Reddened litmus paper was immediately turned blue, indicating the presence of alkali.

7.—The three mineral acids occasioned effervescence, and a precipitate: and a smell in one case like burning sulphur in another like bilge water. Tartaric acid gave a precipitate of supertartrate of potass or cream of tartar,—whence may be inferred the presence of carbonic acid, of hydrogen, or sulphuretted hydrogen, and potassa.

8.—Nitrate of baryta occasioned a dense white precipitate of which a part was soluble and a part not soluble in dilute acid. This test indicates the presence of sulphuric acid, and the partial solubility of the precipitate, points out the presence of carbonic acid. From the last applied tests and the present test we may conclude that the solution contained sulphate of potassa and carbonate of potassa.

9.—The sulphuric acid being removed by the baryta, the clear solution afterwards obtained, was tested with nitrate of silver, which gave a dense precipitate, changing quickly from yellow through various shades to black. This indicates the presence of sulphur, or of sulphuretted hydrogen.

10.—A certain quantity of the residuum was dissolved in distilled water filtered and then boiled; it gave off copious fumes which smelt like bilge-water and which blackened silver. These fumes were sulphuretted hydrogen. The sulphuric and carbonic acids of this solution were then removed by nitrate of baryta; and nitrate of silver was afterwards added and gave a dense precipitate, indicating that the solution contained not only sulphuretted hydrogen, but also an hydro-sulphuret.

11.—The precipitate last mentioned was collected, washed, and dried; and was compared with the weight of the precipitate obtained from an experiment made with a similar quantity of the residuum, only treated with *cold* water, and *not* boiled. The quantity of sulphuret of silver (*i. e.* the precipitate) obtained in the experiment by boiling was grains 12; the quantity in the other case was grains 27.

12.—These last two steps in the examination point out the presence of sulphur in combination with hydrogen, and with potassa; or sulphuretted hydrogen, and hydro-sulphuret of potassa.

13.—Solution of soap in alcohol gave no discoloration.

14.—After removing the sulphuric and carbonic acids, and the sulphur from a portion of the solution, it was evaporated to dryness. From the course pursued there should result saltpetre, being potassa, the base shown by the tartaric acid (7) in combination with the nitric acid of the tests. The salt collected resulted accordingly; it was nitre, and deflagrated as nitre does when thrown on red hot charcoal.

15.—There appeared to be a small quantity of uncombined alkali; for after precipitating the sulphuric and carbonic acids by nitrate of baryta, the clear solution changed reddened litmus paper blue; merely a drop or two of nitric acid however neutralized as much alkali as resulted from 100 grains of the original substance. After this neutralization, and after precipitating the sulphur by the nitrate of silver, the solution contained free acid which was indicated by turning blue litmus paper red: this proceeded from the nitrate of silver, for the silver combining with the sulphur, set the nitric acid free, the alkali of the solution being previously neutralized. This acid manifested itself and was driven off in yellow fumes in melting the saltpetre.

16.—The insoluble residue retained by the filter (5) was small; it was black, but viewed by the microscope, it contained numerous white specks which appeared to be earthy matter. It burned quietly on red hot charcoal before the blow-pipe, without the smell of sulphur, and changed its colour from black to brown. The earthy matter partially dissolved with effervescence in nitric acid. I consider this resi-

due to consist of a small quantity of charcoal, and carbonate of lime and other earths, being small impurities from the saltpetre and sulphur.

17.—Having thus ascertained the general nature of the substance experimented on, we may proceed to the

EXAMINATION OF QUANTITY.

18.—Fifty grains of the alkaline matter were heated over a spirit lamp till they no longer lost weight, and were weighed in a porcelain capsule while hot.

19.—*Note.*—All the weighings hereafter mentioned were weighed hot in the same manner. A small porcelain capsule will weigh 5, or 6 tenths of a grain heavier when cold, than it does when hot.

20.—The 50 grains of residuum were dissolved in cold distilled water; filtered, and washed, till reddened litmus ceased to be affected.

21.—The residue retained by the filter (16) weighed 0.90 of a grain, it was submitted to a red heat; and consisted of

Charcoal, ...	grains	0.25
Earthy matter..........	,,	0.65

22.— The solution was precipitated with nitrate of baryta, (8) the precipitate weighed grains 43.60.

23. This precipitate was treated with nitric acid (8); it effervesced, and when again collected and dried at a heat near redness weighed gr. 23.10.

24.—There resulted therefore—

Sulphate of baryta......	grains	23.10
Carbonate of do	,,	20.50
	Grains	43.60

25.—The solution remaining after this step of the experiment, exhibited traces of free alkali (15) it was neutralized by a drop of nitric acid.

26.—Nitrate of silver was then added until there ceased to be a precipitation. The result was sulphuret of silver grains 15.40.

27.—The solution now contained nothing but the base, potash, in combination with nitric acid. The same indica-

tions occurred as before mentioned (15). The saltpetre was fused and weighed 59 grains.

28.—The result of the analysis by biniary combination, is therefore as follows :—

Sulphate of baryta	gr.	23.10
Carbonate of do.	„	20.50
Sulphuret of silver	„	15.40
Nitrate of potassa	„	59.00

29.—And the several substances indicated by the various tests are the following :—

Sulphate of potassa	(8)
Carbonate of do.	(8)
Sulphuretted hydrogen	(10)
Sulphuret of potassa	(10)
Uncombined alkali (a trace)	(15)
Charcoal and earthy matter	(16)

30.—We ought now from the foregoing biniary compounds to make up the 50 grains of original matter experimented on ; but before doing so it appears necessary to make a few observations.

31.—On the explosion of gunpowder one of the products formed is sulphuret of potassium ; but it is difficult to ascertain the real quantity, because the moment it dissolves in water it is decomposed and forms new compounds, so that the analysis has rather to do with these new compounds than with the original ingredient. The following extract from Henry's Chemistry, Vol. I. Ed. 1826, page 447, will explain the matter more fully.

32.—" The pure sulphurets can exist, as such, only in the " dry state ; for the moment they begin to dissolve in water, " a decomposition of that fluid commences ; sulphuretted " hydrogen is formed ; and of this a part is disengaged, " while another part, uniting with an additional proportion " of sulphur, composes bi-sulphuretted hydrogen. This " last, uniting with the base, forms an hydroguretted sul-" phuret. At the same time, it has been stated by Ber-" thollet, sulphuric acid is composed, by the action of the " sulphur on the oxygen of the water. This however, Gay " Lussac has shown, takes place only when the sulphuret

"has been formed at an unnecessary heat"—but not at a "heat below redness."

33.—On this view of the case it is very plain how some of the substances before enumerated may be accounted for, such as the sulphuretted hydrogen, &c. and it is equally plain that from the complex action of the sulphuret, the analysis must be in some measure governed by it.

34.—I shall therefore in tracing out the ultimate results of the experiment consider the sulphur to be in combination with hydrogen, and with potassa (12) and account for it accordingly. I shall also consider the sulphuric, and carbonic acids to be in combination with potassa (8).

35.—The following course must therefore be pursued:—

23.10	grs.	of sulphate baryta	contain	7.83	grs. of	Sulphuric acid.
20.50	„	Carbonate	do. do.	4.51	„	Carbonic acid.
15.40	„	Sulphuret of silver	do.	1.95	„	Sulphur.
59.00	„	Nitrate potassa	do.	27.76	„	Potassa.
1.95	„	Sulphur is combined thus		1.08	with	potassa (potassium)
			and	0.87	with	Hydrogen.

36.—Again—

7.83	sulphuric acid make when combined with potassa.	17·22	Sulphate of Potassa.
4·51	Carbonic acid do. do.	14·35	Carbonate of potassa.
1.08	Sulphur do. do.	3·78	Sulphuret of potassium.
0·87	do. combined with hydrogen	0·87	Sulphuretted hydrogen.

37.—We have now to ascertain from the foregoing, how they affect the results indicated by the saltpetre, and what quantity of the base, potassa, they consume, or are combined with; and whether the saltpetre affords just a sufficient quantity of the base, or whether it is deficient, or in excess.

38.—The quantity of potassa in 59 grains of nitre is 27·76
of which 7·83 of sulphuric acid combine with 9·39
4·51 of carbonic acid take up 9·84
1·08 of sulphur may be combined with 2·70
Surplus potassa 5·83
——27·76

39.—That there was some uncombined alkali contained in the substance under examination has been before shown (15) but the quantity was very small, and could not possibly amount to the above surplus of grains 5·83. The question therefore

is, with what was this potassa combined? It is very clear that it was not, and from the course followed, could not be introduced during the analysis, because no potassa was used under any of its combinations. And as it is evidently a surplus beyond the quantity in combination with the sulphur, and the sulphuric and carbonic acids, the most reasonable supposition seems to be that it existed in combination with nitric acid, and was simply saltpetre that had escaped decomposition. I shall therefore so account for it, and the quantity of saltpetre which it is equivalent to is grains 12·39.

40.—The ultimate analysis of the 50 grains of matter experimented on will then stand thus :—

Sulphate of potassa	17.22	(36)
Carbonate do.	14.35	(36)
Nitrate do.	12.39	(39)
Sulphuret of potassium	3.78	(36)
Sulphuretted hydrogen	0.87	(36)
Unconsumed charcoal	0.25	(21)
Earthy matter	0.65	(21)
Experimental error	0.49	
Total grains	50.00	

41.—It is not to be inferred from the foregoing quantity of saltpetre that nearly 25 *per cent.* of what is originally in the gunpowder is undecomposed, or unnecessary—for this quantity has reference only to the solid matter remaining after gunpowder has been fired. And I am inclined to think that this quantity is accidental, and is to be attributed to the imperfect mixture of the substance (3) before the experiment was commenced. I have made two other analyses of 100 grains each, after the original matter was better mixed, and the quantity of saltpetre in those experiments is exhibited at only 14 or 15 *per cent.* As these experiments were conducted precisely in the same manner as the 50 grain experiment, which has been fully explained, I shall here insert them as a part of the original investigation.

	2d Expt.	3d Expt.
Sulphate of potassa	45.44	46.83
Carbonate of potassa	29.75	26.73
Nitrate of potassa	14.81	15.34
Sulphuret of potassium	5.49	6.65
Sulphuretted hydrogen	1.38	1.52
Unconsumed charcoal	0.56	0.60
Earthy matter	1.89	2.00
Experimental error	0.68	0.33
	100.00	100.00

42.—Doubting however whether the result of saltpetre was not too large, I tested a portion that had been collected, and found that it contained sulphuric acid in considerable quantity. After the precipitation by nitrate of silver and while evaporating the solution of nitre, I fancied in every experiment that there was a smell of sulphur, but I could not detect it, for the precipitations by silver had been carefully performed, so that the solutions afterwards exhibited no traces of sulphur. Notwithstanding, I suspect that the solution of nitre did contain a minute portion of sulphur, and as it also contained free nitric acid (15) the presence of these two substances when the last portions of the saltpetre were evaporating, and when it was afterwards in fusion, will account for the formation of the sulphuric acid, which would I apprehend combine with the potash. And as 15 grains of the saltpetre gave sulphate of baryta equivalent to 1.71 of sulphate of potassa, the quantity of saltpetre in the two foregoing analyses might be reduced in that proportion. But as this ulterior result does not appear to legitimately affect them, I shall not make the alteration.

43.—Finally, to confirm or to remove the doubt just expressed, I made a synthetical mixture according to the analysis, employing 15 *per cent.* of nitre as a mean between the two experiments, and on submitting it to the action of the blow-pipe on red hot charcoal, its action was as similar to the action of the original substance as it could be. This verification is satisfactory, and seems to point out that the analysis has been correctly performed.

10*th November*, 1835. J. BRADDOCK.

II.—*An account of the Maun Bhows; or, the black clothed Mendicant Devotees.—By Captain* A. Mackintosh, *27th Madras Native Infantry, Commanding Ahmednuggur Police Corps.*

It is well known to every person who has either read the History of Hindoostan, or sojourned in India, that numbers of beggars and devotees ~~(Fakeers as they are frequently and indiscriminately termed)~~ are to be seen in every town and village in this country: indeed, it has been estimated, that an eighth of the Hindoo population subsist by mendicity; for not only the lame, the blind, and the sickly go about begging; but various sects have at different periods, formed themselves into associations or societies, passing their lives in Mhutts or monasteries worshipping particular deities, and visiting sanctified places of pilgrimage, being entirely supported by the eleemosynary donations of the rest of the inhabitants.

In the following pages a short account is given of the sect of Maun Bhows, or the black clothed mendicant devotees: who are dispersed over the country lying between the Syadray chain of hills (the elevated range which separates the Konkan from the Dekhan) and the eastern limits of the Berar country: and the Kistna river and the northern boundary of Malwa: a few of the sect are also to be found in the Punjab.

It may be observed here, that this sect of religious mendicants, appear to partake much of the character of the Franciscans, and the Benedictines, &c. particularly of the Canobite monks who lived in community under superiors in the same dwelling; and of the Sarabaites who wandered from place to place.

The history of the origin of the fraternity of Maun Bhows, is like that of almost all other sects in India, involved in obscurity and fable. By the Brahmins they are considered an heretical and most degraded caste: the Brahmins wish it to be believed that they not only are of modern origin, but also are the offspring of a female of the Maug tribe (one of the vilest of the degraded classes) who resided in a Brahmin's house; and on which account the Brahmin (Kishen Bhutt)

was excommunicated from his order. As these mendicants show little or no respect to the Brahmins, they seem to think this is the reason of their imputing such an impure origin to them. The Maun Bhows themselves assert, that their fraternity has existed from time immemorial; that during the Krittah Yeoguh (or the first age of the world according to the Hindoos) the four sons of Brahma named Sunuk, Sunuk Adik, Sunuk Nundun, and Sunnuk Koomar, were the spiritual guides of the Maun Bhows: and during the Tretah Yeoguh, Duttatry (*) Swamy was their spiritual guide; and in the Dwarpah Yeoguh when the deity appeared on earth in the person of their beloved Krishen, and declared himself the friend and instructor of Arjoon and Oodhow, that both of the latter were elected the spiritual guides of the Maun Bhows; at the above period the Maun Bhows worshipped Krishen as their true and only god to the exclusion of all others. They state, that in the present age or Kaly Yeoguh the two spiritual brothers Kuveesswurbas and Oopaadbas were the chief Mhunths or the superiors of their order; and as the country at the time was in a very unsettled state, so much so, that poor and pious pilgrims encountered the greatest imaginable difficulties when strolling from one Mhutt to another, owing to the roads being infested with robbers: that the members of the fraternity came to the resolution of adopting black clothes as their dress; the colour being sacred to Krishen, and appearing in such a humble and unassuming habit, would ensure impunity from robbers, and prevent other persons being uncivil to them.

Notwithstanding the plausibility of this attempt, to establish the antiquity of the institution of their order, I am disposed to think that it merits little credence; for by all accounts there is no allusion made to this sect in any of the Hindoo works treating of the pure and mixed castes according to the Unoolome and Pruteelome order, that were known to have existed about twelve or fifteen hundred years ago. Under these circumstances it is natural to conjecture, that about a thousand years may have elapsed since they originated; for there is a tradition of the famed Heemar Punt, who it is said was some eight hundred years since, prime mi-

(*) In the Bhagavata Puranam it is stated that Dattatreya was the son of Vishnu, by Anusuya wife of Atri, the maha muni. But Atri

nister to a Rajah of Dewgir (the present Doulutabad) having attempted to suppress the sect of Maun Bhow heretics when they first made their appearance at the town of Pytun on the Goodavery. The chief Mhutts belonging to the fraternity are at Rood'hpoor or Reed'hpoor a town about twenty-five miles east of Elichpoor in Berar: the Maun Bhows venerate this place as much as other Hindoos do Benares. The two spiritual brothers Kuveesswurbas and Oopaadbas established their Mhutts here: and from these two collateral stocks, the following branches have sprung:—

From the Kuveesswurbas..........	From the Oopaadbas
The Durriahpoorkur................	The Patoorkur
,, Ballapoorkur....................	,, Dharashookur
,, Edoonashy......................	,, Waiedeshkur
,, Ambykur.......................	,, Sookenykur
,, Khomnykur.....................	,, Beerkur
,, Kuppattykur...................	,, Bhojnay
,, Punjabby......................	,, Sewrykur
	,, Akoolnairkur

Again,—from these fifteen branches, or villies as they are termed by themselves, numerous other ramifications have diverged—besides the two chief Mhutts at Rood'hpoor there are five minor ones there—the Rassygaunkur, the Ballapoorkur, and Durriahpoorkur, likewise the Beerkur, the Tullykur and the Paunch Rahout. It is quite evident that the name given to each Mhutt was that of the district or village from which the founder originally came. The Paunch Rahout is termed so, from five horsemen that came from some distance to be converted to Maun Bhowism, and who afterwards settled at Rood'hpoor. It is not uncommon for them to apply some familiar term to the shrines in some of the Mhutts such as:—Rajmhurr, Prussund Mhun, Sheewa Baie, Abbah Sahib, and Babbah Sahib.

The Mhutts at the following places are reckoned the principal ones of the sect:—

1.—Rood'hpoor near Ellichpoor.
Punchalleshwur near Rakisbhaun.
Oosswar near Chandore.
Beer.

Dombygram near Toka.
Sookena near Nassik.
Wakie south east of Ahmednuggur.
Durriahpoor in Berar.
Akutpoor in Berar.

At the full moon of Chytre (Chytre poornimah falling in A. D. 1834, on the 23d of April) pilgrimages are made to the shrines of the god Krishen at Rood'hpoor, Punchallesh-wur, Kunnassy in Kandiesh and Dombygram near Teka; and at the full moon of Kartick (in A. D. 1834, the 16th November) pilgrimages are made to the shrines at Akut-poor and Wurnere in Berar, at Wakie and Sookena.

The Maun Bhows it may be said scarcely observe any fast days, as the followers of Siva and Vishnoo do—but they reckon the month Margysur the most sacred as Krishen calls it so in the Geeta. The day of Krishen's birth, the Gokull Ashtmy or 8th of Shrawin is kept as a festival.

In their Mhutts, the Maun Bhows have invariably a chu-bootra, or raised platform built of brick and lime. About two and a half cubits in breadth, and between three and four cubits in length and about one in height. These plat-forms are said to be erected on particular spots where the deity manifested himself on some occasion during a former age. No places of the kind are consecrated in the present day. The Maun Bhows being strict followers of Krishen, place implicit faith in the account of his life as given in the Bhagwut (generally termed the 18th Pooran) and reject all the other sacred shasters of the Hindoos, as they reject the worship of all their other gods.

By Europeans, Krishen has been termed the Apollo of the Hindoos; and it must be admitted that they greatly resem-ble each other, in many instances. However, he is describ-ed by some of the Hindoo writers as being the most wick-ed, base and debauched of characters. While others re-present him as being all meekness, piety and benevolence. He is known to the Maun Bhows only as possessing the lat-ter virtues; and the numerous irregularities he is accused of, they explain by saying that these were merely typical of the mutual attraction between the divine goodness and the

human soul: and they refer with delight to what they conceive the sublime representation given of him in the Geeta when he is engaged in instructing and conversing with his much beloved Arjoon: " Behold things wonderful, never seen be-" fore, behold, in this my body the whole world, animate and " inanimate. But as thou art unable to see with these thy " natural eyes, I will give thee an heavenly eye, with which " behold my divine connection."*

" The son of Pandoo† then beheld within the body of the " god of gods standing together the whole universe divided " forth into its vast variety. He was overwhelmed with " wonder, and every hair was raised on end. But I am " not to be seen as thou hast seen me, even by the assistance " of the Veds, by mortification, by sacrifices, by charitable " gifts: but I am to be seen, to be known in truth, and to be " obtained by that worship which is offered up to me alone: " and he goeth unto me whose works are done for me: who " esteemeth me supreme: who is my servant only: who " hath abandoned all consequences, and who liveth amongst " all men without hatred."

Again,—" He my servant is dear to me, who is free from " enmity, the friend of all nature, merciful, exempt from all " pride and selfishness, the same in pain and in pleasure, pa-" tient of wrong, contented, constantly devout, of subdued " passions, and firm resolves, and whose mind and under-" standing are fixed on me alone."

" They trust to their carnal appetites, which are hard to " be satisfied; are hypocrites and overwhelmed with madness " and intoxication.—They seek by injustice the accumulation " of wealth for the gratification of their inordinate desires."

" The Yeogee‡ is more exalted than the Tupuswees,§ those " zealots who harass themselves in performing penances, res-" pected above the learned in science, and superior to those " who are attached to moral works; wherefore O! Arjoon, " resolve thou to become a Yeogee, of all Yeogees I respect " him as the most devout, who hath faith in me, and who " serveth me with a soul possessed of my spirit."

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* Wilkin's Geeta. † Arjoon. ‡ A devout man. § An Ascetic.

The above extracts from the Geeta which constitutes the Maun Bhow's sacred volume, will partly show what the tenets of their belief ought to be. We know that the Brahmins profess their belief in a Supreme and Eternal God, but that from motives of policy and for the purpose of engaging the attention of the ignorant, it has been deemed necessary and becoming to pay their adoration to the Omniscient through the medium of image worship. The doctrines of the Maun Bhow faith, seems to be a spiritual system of pure deism, which teaches them to lead a simple, innocent and pure life, renouncing all connection with worldly affairs, and occupying their time as much as possible in meditating on the attributes of their deity in the hope that they may obtain final beatitude by absorption into the essence of the Supreme Being.

It can scarcely be supposed that the Maun Bhows would have many converts to their faith ; or that their creed would be very popular with the people : the circumstances of their being obliged to lead a wandering and most abstemious life, to subsist on whatever the charitably disposed may bestow on them ; to submit patiently to indignities that may be offered to them ; and to be attired in the doleful habiliments of their order, might altogether be considered very forbidding and quite sufficient to deter many persons joining their fraternity —who otherwise would have no objection to pass an indolent life and live on the bounty of their friends. But the main support of the sect arises from the superstitious character of the Hindoo females and that of many of their husbands : for it is not unusual for such females as have been disappointed for several years in not having any offspring, to vow that in the event of their longed for wish being realised, through the favour of some god or the blessing of some holy personage, they will dedicate their first-born, whether it be a male or female child to such a deity or devout character. In the Mharatta country children are frequently consecrated to the Maun Bhows in this way, likewise when the children of a family continue very unhealthy or die from some constitutional disease, the parents will vow to dedicate one of them to the Maun Bhows : or a child is handed over to them

in fulfilment of some other vow. The fraternity are chiefly recruited from among the Koonbies (farmers) and other classes of the Shoodur division: it is very seldom that any persons of the higher castes become converts, although there are a few instances of Brahmins joining them: there is a Brahmin in the Ahmednuggur district who was for some reason induced to become a Maun Bhow about six years ago: he however subsequently regretted having abandoned his own order: and expressed a great desire to be re-admitted among them; he now continues to be rejected by his old friends and relations, and despised by his new brethren.

It is to be stated, that the different Kools or Villies, into which the Maun Bhows are divided have a chief or superior in each Mhutt termed by them Mhunth: his followers are termed Chelaks, Sishas, (disciples).—The Mhunth is highly reverenced by his followers and is invested with patriarchal authority: when the office of Mhunth becomes vacant, the disciples assemble to elect a successor from among themselves to fill the situation. The person who is known to be most pious and experienced, and altogether considered best qualified to fill the vacant situation, is nominated on such occasions. Should a Mhunth at any time be guilty of any impropriety of conduct, and justly incur the censure of the members of the society, he either will see the necessity of relinquishing his appointment of chief, and quitting the country, or some of his friends will point out the propriety of his doing so, to avoid his being publicly expelled. When a Mhunth vacates his office by withdrawing himself from it, the superior of the Kuveesswurbas or of theOopaadbas from whichever the Villy may have sprung, nominates a Mhunth to fill the vacant gaddy.*

There are instances of Mhunths who have arrived at an advanced age, nominating one of their disciples to be their successor, and afterwards quitting the gaddy and living the few remaining years of their lives in retirement. This is the case at present at Busswunt in Berar. The aged Mhunth Dhamodhur Dharashookur has placed all authority in the

* A seat, cushion, throne.

hands of his shisha Purbahkur. Should any of the disciples die worth any property, the Mhunth succeeds to it, but the money is expended in celebrating the customary rites on the occasion of his death. And if a disciple dies in destitute circumstances, the expenses incurred at his funeral, are always defrayed by the Mhunth. Unless one of the brotherhood who is a very particular friend of the deceased, expresses a wish to bear the charges of the funeral expenses.

The Maun Bhow's Mhutts are sometimes outside of villages, on the banks of a river, or in the middle of the town, and occasionally at a considerable distance from any dwelling. When the Mhunth proceeds on his wandering tour, he leaves one or two of his followers in charge of the Mhutt, with permission to appropriate to their own use any thing that may be granted in charity during his absence. The Mhunth takes from twenty to fifty of his followers with him (including females, boys and girls) and always uses a Palkie, in which his followers (acting as bearers) convey him from place to place. The rest of his followers disperse over the country, and continue moving about for several years, unless asked by some charitable person to reside in some particular village for a few weeks, months, or longer period. The Mhunth probably will return, after the expiration of one or two years, to his Mhutt.

During the four rainy months,* the Maun Bhows discon-

* For containing water they have at times vessels of various sizes made of five or seven folds of cloth soaked in the juice or oil of the Bheelawun or marking nut, (the semecarpus Anacardium) and the cloth being plastered inside and outside with red ochre, it gives these vessels a degree of consistency and an appearance as if they were made of earth. It is invariably during the rainy season that these vessels are manufactured; they are highly prized by the Maun Bhows; the operation of making them is however extremely tedious; and few persons can undertake to execute such work owing to the very peculiar quality of the Bheelawun; the expressed juice of this nut touching any part of the hands, face, neck, &c. produces not only a most disagreeable itchy sensation, but it causes the arms and face to swell, and small sores or pimples to arise in consequence. (I once saw an officer at Ahmednuggur who experienced pain and much annoyance from its effects). The few persons that are engaged in making these vessels rub their hands, face, neck and breast with any of the common oils procurable in the bazars; and their food ought to consist chiefly of sour milk and butter milk; and to abstain from spices or any heating ingredients. Those of a plethoric habit run less risk of suffering from the effects of this nut. The natives use the Bheelawun for removing rheumatic pains, &c.

tinue their wanderings, and take up their residence for the monsoon in any village where they have some friends, or where they are likely to experience from the inhabitants civility and attention. It frequently happens that they collect in considerable numbers at the same village. Last year an assemblage of between six and seven hundred of them passed the monsoon at the village of Tembah near Sooltanpoor in Kandeish: during the eight months they are occupied in performing their peregrinations they endeavour to lay by a part of what they receive in charity* for the monsoon season: and some of the rich merchants or wealthy persons, either for the sake of the bubble reputation or in the hope of expiating some sin they may have been guilty of, undertake to supply the pilgrims with the necessary quantity of provisions for their consumption for some time; and if a sufficiency is not obtained in this way, and the rains have not terminated, they will borrow money from any money-lender to defray the expense they may have to incur while they remain in the place. The sum they borrow, they engage to pay off in a few months —and they generally effect this with comparative ease; for when they recommence their wanderings, and are busy begging from door to door, to such persons as they know to be of a liberal disposition, they communicate the circumstance of their being in debt and their anxiety to pay it off: it is very seldom such an appeal from a Maun Bhow does not meet with consideration: however they say that within these few years past, the inhabitants within the British territory do not show them that attention and liberality they experienced from them in former years: they add that the people excuse their present conduct, by informing them that they are prohibited granting alms now as in times past. (To be continued.)

It is at the period of the general halt in the wet weather, that they teach their converts to read and write; for the Maun Bhows consider it indispensably requisite, that every member of their society should be sufficiently educated to be capable of reading one of the commentaries on the Geeta;

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* If they succeed, in collecting any considerable quantity of grain and its transportation would be inconvenient, they convert it into cash.

and such persons as are too advanced in age, or from any other cause, are rendered incapable of receiving instruction, are taught a few sacred words or sentences, which they are enjoined to continue repeating very frequently. Exclusive of the Geeta every Maun Bhow has either a copy of the Hurry Veeja, the Rookhmuny Sywur, the Radha Kishen, or the Pandoo Purtaub in his possession ; these are in the Prokrut language. It is usual for some one of them to read a chapter from one of these books of an evening : and a few of the different classes of the villagers frequently form a portion of their audience on such occasions.

When the Maun Bhows are questioned by Brahmins or other persons they are unacquainted with on the subject of their faith, or in any way connected with their habits and customs, they will not unfrequently reply by repeating some proverb, or illustrate their explanation by means of parables : I have seen some of them who are capital story tellers.

The Maun Bhows wear leather shoes, but strictly speaking they ought not to do so ; however, at the time they take their wallet in one hand, and their staff in another, and go begging from house to house, they are then barefooted; but some few of them make up slippers of thick cloth which they are permitted to wear at all times. Should four or five of them or a larger number arrive at a village, instead of going to each house they go to the Patell and ask him to grant them something in charity; and if they receive a sufficient quantity of grain from him* they retire with it; and as a particular duty is assigned to each in preparing their victuals, they now respectively busy themselves in bringing firewood and water, grinding the corn and cooking, &c. But if they do not receive enough of grain in the first village they visit, they move on until they have collected sufficient for the days consumption. They hold flesh, fish, and spirituous liquors in abhorrence; and so very anxious are they to avoid giving pain or putting to death the smallest insect, that they carefully strain the water they intend for their own use through a cloth ; and then turn the cloth upside down, shake

* The Patell (headman of the village) collects a little from each of the villagers and presents it to the Monks.

and wash it in the running stream or well, that all the insects may be restored to their natural elements. As some of the inhabitants of the chief towns in the Mharatta country are in the habit of sacrificing a number of sheep at the Dussira festival, the Maun Bhows make a point of keeping at a distance from the villages where such scenes take place.

It is worthy of notice that the Maun Bhows never will take any flour or grain from a basket in the bazar, or corn or vegetables from a field, or pluck fruit of any description from off a tree although the owners tell them to do so. They invariably wait till the proprietor or person employed by him has helped them with his own hands, otherwise they will pass quietly on.

During the jutras or pilgrimages to the different shrines of Krishen at the time of the annual festivals, it is customary for persons who have made vows in the name of the Maun Bhows, to entertain a certain number of the pilgrim devotees for one, two, or three days; and such of the Mhunths as may have been fortunate enough to receive in charity any money, or large quantity of grain, make a point of entertaining all the Maun Bhow Alteeths (religiously austere characters) that may be present for one or more days*.

The Hindoos of the present day although in general very remiss in the observance of their religious duties, few of them, especially of the lower orders, will approach a temple or pass a rough stone or block of timber besmeared with red paint (Sendoor, Minium) and stuck up in a field or under a tree, as the representative of some tutelary deity, without performing the Numskar, (customary salutation). The Maun Bhows on the other hand abhor these red painted stones or blocks, and if they are aware there is one in the road they are travelling, they will make a circuit to avoid it.

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* The Mhunth Sadhy Raz of the Punjuby villy, received a considerable sum of money in a present from Hindoostan, and in consequence sent notice to many places inviting the Maun Bhows to Rood'hpoor, on Chytre Poornimah 1831, as he meant to entertain all that would attend; about fourteen or fifteen thousand pilgrims visited the place and he provided provisions for all for nearly one month, till the Cholera made its appearance and forced them to look for safety in flight. Nothing is more common than to hear of the Cholera making its appearance among the crowds of pilgrims that assemble on such occasions.

The Maun Bhows reckon it a meritorious act to persuade persons to become converts to their faith ; they however exercise a very considerable degree of caution in guarding against persons of improper character being admitted into their society, unless the candidate or person desiring to become a Neerwan (a sanctified character) is known to some of them : they interrogate him very particularly for the purpose of ascertaining what his real motives are in wishing to renounce the world and to join their fraternity : and if the candidate is an inhabitant of the place at which they are residing at the time, they will make enquiries to the same effect in the village. The Maun Bhows are always extremely anxious to avoid giving the least umbrage to the relatives and friends of a candidate. They warn him publicly to consider well the nature of the step he is desirous of taking, and that they cannot comply with his wish, until they are well informed respecting him. It is probably after asserting he would apply to some other Maun Bhows to be instructed by them, that they are induced to listen to his arguments : however they deem it necessary to watch closely the conduct of the novice for some time. They point out to him the propriety of reconsidering the step he is about taking, before he decides finally on becoming one of their brethren; for that in his new life (they look upon it as a state of regeneration) he will have to encounter many difficulties and privations, and that unless he is satisfied in his own mind that he possesses sufficient resolution, patience, temperance and virtue, it will not be in his power to conform with the obligations he places himself under, after he has forsaken temporal things and put himself under the guidance of one of their Gooroos (spiritual instructors).

The novice is now exhorted to be steady in his conduct and to venerate and adore their god Krishen, and to reject the worship of all other gods. That the name of Krishen is never to be forgotten but always to be uppermost in his thoughts. That in all his dealings he is invariably to evince the greatest meekness, resignation and contentedness. Always to be most particular in telling the truth, and to speak evil of no one, and he is recommended to confess readily any

sin he may be guilty of and ask for pardon: to subdue all carnal desires and content himself with the simple and scanty fare he can procure by begging, and by such a course prove himself a sober, obedient and pious Maun Bhow. In the event of the novice being convinced in his own mind that he can abide by the obligations of the vow he is about taking namely, that of chastity, poverty and obedience, he is required to confirm his intentions by taking an oath on the Geeta to that effect. This will be in a few weeks, or months from the time he expressed a wish to become a convert; all depending on the manner in which he has conducted himself while he remained with them. The ceremony of his initiation then takes place, the village barber's services are put in requisition on the occasion, he shaves off the candidates hair, but it is the invariable duty of the Gooroo to cut off the Sendhy* or tuft of hair on the crown of the head, and his mustaches or hair on his upper lip, (which all natives preserve) after this he bathes and dresses in black clothes, the costume of the order; the munter or incantation of the fraternity in the Prakrit language, is then whispered in his ear by his Gooroo, who gives the novice at the same time, a new name indicatory of the circumstance of his new birth.

The ceremony of initiating females, is performed in the same manner as the above, only that in general an old female of the society acts the part the Gooroo performs in cutting off the tuft of hair on the crown of the head. The cloth worn round the waist and down to the ankles by the females is quite black and ought to be twelve cubits in length and two and a half in breadth. The length of that worn over the shoulders is according to circumstances,—this cloth is divided into three divisions, the centre one is part of a woman's common sary and the two end pieces are dark, but not of such a dark hue as the other garments. The dhottur used by the men is worn double; the oorny or cloth they wear over their shoulders and their turbands are not of so black a colour as their dhottur. The few Maun Bhows who

* The Sendhy of the various candidates is preserved till a considerable quantity of hair has been collected when ropes are made of it which they fasten round their loins.

reside in the Punjab wear clothes of the hoormoojee, or red ochre colour.

When a man has left his family and becomes a Maun Bhow he either gives away what property he may have possessed to his family or relatives, otherwise he presents it to his Gooroo or Munth, who soon expends it in entertaining his disciples. It is very seldom the novice retains for his own use any money he had in his possession previous to his conversion.

Boys and girls that have been consecrated to the Maun Bhows, are dressed in black clothes after they have been delivered over to the Gooroos, but the munter of initiation is not communicated to them until they have attained the age of fifteen or sixteen years; and seem worthy of having the secret confided to them. The male and female members of the society reside in the same Mhutts, but sleep in separate apartments, as they are taught from the day of their initiation to regard each other strictly and sacredly as members of the same family; they consequently look upon each other in the light of father or mother, brother or sister. The circumstances however, of their residing under the same roof, and the habits and frailties of the Hindoo people being well known to each other, gives room to the idle and malicious to talk rather calumniously of the general chastity of the females of this community, however when any one of them does sin, and she exhibits symptoms of becoming a mother, she and her paramour are admonished and required to ask pardon and do penance for the act they have been guilty of, and in bringing disgrace on the society by their shameful and discreditable conduct: having thus transgressed against the rules and customs of the order, it becomes necessary for the sinners to retire from the Mhutt and to discontinue moving about the country in company of the Neerwans (rigidly austere) and they therefore take shelter in some retired village, and take up their permanent abode in the place, if they find it possible to subsist by begging and following some other pursuits. They are then termed Ghurbars, Grushts, or lay brothers. There are several of these to be found in the villages in different parts of the country, who are allowed to possess

houses, lands, and riches, and to follow other pursuits. Some years ago I had one of them employed in the Police; they are also permitted to enter into the bonds of conjugal tenderness, but who in other respects with the exception of wearing black clothes, adhere strictly to custom and habits of the order.

It is not unusual to hear of the Maun Bhows having followers among the Koonbies and other classes who are termed Bhoalls (persons who abstain from partaking of flesh, fish, and spirituous liquors). The Bhoalls do not cut off the Sendhy or wear black clothes, but they receive the munter of initiation after having solemnly vowed on the Geeta that they will acknowledge Krishen as their only god, and that they will abandon the worship of all others. It is absolutely necessary for the man who becomes a Bhoall to have his wife also initiated, but then it must not be by the same Gooroo or a member of the same villy or Mhutt that instructed her husband: were they both to be initiated by the same Gooroo, the distinction of husband and wife would no longer exist; they would become members of the same family and be considered as brother and sister; and with the Bhoalls such a consummation is not desired.

These Bhoalls* frequently attend the shrines in Mhutts when the Maun Bhows are absent and receive any offerings presented in the name of Krishen, these consist of every description of fruit, sugar, rice, bread, &c. and all sorts of flowers except the Kunner or Oleandur.

* About three miles from Rakissbhaun there is a small village named Sagur on the banks of the Godavery, where about a hundred years ago there resided a female of the Maun Bhow sect, in charge of the Mhutt. It appears that the wife of a poor Mussulman an inhabitant of the place despaired of having any children and after the manner of the Hindoos she presented herself before the Devotee and asked her for her blessing, and she vowed that if she should have a child it should be consecrated to Krishen. It so happened that her hopes were realized and in fulfilment of her vow she presented the child to the old Maun Bhow Devotee; who entreated of the mother to keep the infant, as she could neither receive nor adopt it as it was not of the Hindoo faith; after much persuasion on the part of the mother, the old woman allowed her to leave the boy in the Mhutt with her. In the course of a few years the old Maun Bhow woman died, and the proselyte remained in charge of the shrines, he afterwards married and his descendants continue in charge of the place. They wear black clothes, abstain from flesh and spirits and subsist by begging and on the offerings presented at the shrines.

About sixty years ago, a Brahmin named Annund Rooshy an inhabitant of Pytun on the Godavery, maltreated a Maun Bhow who came to ask for alms at his door. The Maun Bhow after being beaten proceeded to his friends in the vicinity, they collected a large number of the brethren and went to the Brahmin to demand satisfaction, Annund Rooshy assembled a number of Goossynes and his friends and pursued and attacked the Maun Bhows who fled and asked Aylla Baie to protect them; she endeavoured to pacify Annund Rooshy, by telling him that the Maun Bhows were her Gooroos, he said they were Mangs* however he then declared that if they agreed to his proposals that he would forgive them,—one of them was that they were not to go to a Brahmin's house to ask alms, and another was, that if any Brahmin repeated Annund Rooshy's name and drew a line across the road when a Maun Bhow was advancing, that the Maun Bhow without saying a word must return the road he came, notwithstanding this attempt to prevent their approaching a Brahmin's house, they continue to ask alms of the Brahmins and some Brahmins make a point of supplying them with provisions.

The sect of Maun Bhows have hitherto in general been much noticed by the Holkur family. The famous Aylla Baie was always very kind to them, and bestowed several villages in jageer on members of their community. The village of Oosswar now Chandore, continues to be held in jageer† by a

* Every Maun Bhow male and female is furnished with a rosary. The beads about the size of a cherry stone, are made of the toolsy (ocimum sanctum) sacred to Vishnoo. The chundun or sandalwood (satalum album) the looraty (the cytisus cajan) and chappa (the michelia champacca) sacred to Krishen.

† About 122 years ago a Maun Bhow Mhunth named Krishen Bowa, had attained great celebrity on account of his knowledge of medicine; and, being considered deserving of some reward, the Neeballkur chieftain of Kurmulla who held the town of Jowur, in jageer, presented him with sixteen Begahs of ground, in enam (freehold gift). The farmer who held the ground on the meerassy (hereditary) tenure, continued to cultivate it, (which the descendants do to this day) presenting the Maun Bhow with half the annual produce of the field. Krishen Bowa's successors for a length of time were his own disciples, however one of these eventually became a Ghurbar (lay brother) so that the present possessor has got a family. Before the ground was granted in enam, the rent paid to Government, was twenty Rupees yearly, but one of the Maun Bhows improved his little property by digging a well, which enabled them to convert about twelve Begahs of it into garden ground, which has so greatly increased its value that the Maun Bhow receives now fifty rupees income yearly.

female Maun Bhow, and it may be stated that Toolsy Baie, the favorite of the late notorious Jesswunt Row Holkur who was beheaded by the chief of Holkur's army on the evening preceding the battle of Mahidpoor, was of the Maun Bhow tribe. It is said that Jesswunt Row, was smitten by her beauty and took her forcibly away from her friends; she was a woman of dissolute habits, and led a most abandoned life after the death of Jesswunt Row Holkur : but as a full account of this very extraordinary female has been given by the late Sir John Malcolm, in the seventh chapter, of the 1st volume of his very interesting History of Central India, there is no occasion for saying more about her in this paper.

The Maun Bhows bury their dead but at some distance beyond the limits of the village cemetry. The body is put into the grave with the head to the north, and the feet to the south, and reclining on the left side with the face to the east. A quantity of salt is put into the grave, and heaped round the body, it is said, to prevent it becoming too offensive during thestate of decomposition, by which means the wild beasts might discover the grave and be induced to scratch it open.

The Maun Bhows have divested themselves of several of the Hindoo prejudices ; they do not consider that any defilement (sootuk) arises from the death of one of their community: nor do they attend to the ceremonies of the Shraadh (offerings to the manes), like the other Hindoos. In the event of one of the fraternity dying and he leaves any money, it is invariably expended in entertaining a certain number for a period of ten days : should the deceased have died in a state of poverty, the Mhunth or superior expends a few rupees to admit of a certain number of the brethren being entertained for the usual number of days : and should a Maun Bhow expire where none of his tribe are residing, the Bhoalls or Koonbies of the village will bury him, and any money he may have left is carried to the nearest Mhutt ; it is all disbursed in entertaining a few Alteeths during the number of the days that may happen to remain of the first ten days that they celebrate in remembrance of the deceased.

If we only compare the character of the Maun Bhow devotees with that of other religious sects to whom in some respects they bear a resemblance, such as the Goossynes, the Byraggies, Wagheas, &c. we shall discover some very marked distinctions between them. The humility, the patience and inoffensive demeanour of the Maun Bhow, is very remarkable, and his veracity and steadiness of purpose are so established, that it has become to some extent proverbial among the Koonbies and others to remark of a person reformed in his habits, "why he has acquired the forbearance and humility of a Maun Bhow"—or "he seems to possess the integrity of a Maun Bhow." The Goossynes, &c. are in general notorious for their licentious habits, bold and enterprising conduct, and obtrusive and overbearing manners. These men often grossly abuse the freedom their sanctity of character confers on them, and which otherwise ought to ensure a most welcome reception to them from the inhabitants of the country, when they are wandering from place to place. The consequence therefore is that we find all descriptions of vagabonds attired after the peculiar manner of these devotees. It is a very common practice for swindlers, robbers, and murderers, when they are going to commit some malicious or wicked act to adopt the dress of a Goossyne, and affect to follow his habits to prevent being either known or suspected: and persons that have been guilty of perpetrating crimes and apprehensive of being seized, assume the dress of a Goossyne to enable them to elude detection and to effect their escape.

III.—*Suggestions for a new application of grafting.—By* Robert Wight, Esq. M. D. *Surgeon.*

To the Editor of the Madras Journal of Literature and Science.

Sir,—To those who observe the signs of the times, it must be evident that reform is the order of the day, otherwise we could scarcely have expected, in Madras, the proverbially benighted presidency, in the short space of two years, two such vast improvements, as the successful establishment of a

scientific journal, and the formation of a Horticultural Society; the one fitted, *inter alca*, to diffuse a knowledge of the useful discoveries made by the other, as well as of useful suggestions to be acted upon, either by the society as a body in its experimental garden, or by individuals favourably situated for conducting such inquiries.

It would appear from their selecting horticulture, a science both useful and ornamental, as the starting post of their reforms, that the society of this presidency have wisely determined, to commence with objects of a practically useful kind, in which all take an interest, and can with a clear conscience unite in forwarding, whatever his political opinions may be, objects in short about which "Whig and Tory all agree."

This is wise, as all may now with one accord, unite in an effort to shake off that lethargic indifference to local improvement,which has so long clung to us, and procured for us, among our, *soi-disant*, enlightened neighbours, the not very flattering cognomen of benighted. The time has now arrived for making such an effort, and I trust the presidency members will be ably seconded by their brethren in the provinces, who surely cannot remain indifferent spectators of attempts made to augment their individual comforts, by extending the commercial resources of the country, and thereby advancing national prosperity. In the belief that many of your readers are Horticulturists, and desirous of actively co-operating with the society in the good cause, I send you the following suggestions, in the hope of seeing them speedily and successfully acted upon. I expect they will have another good effect, that of pointing out the Madras Journal as an excellent channel, through which to make known the result of experiments undertaken for the advancement of the science, whether successful or otherwise. If this course was generally adopted it would in the course of a few years become as it were a storehouse, in which might be found recorded, every important fact, tending to the improvement of horticulture on this side of India, to which compilers might always have recourse, with the certainty of being able to cull from its pages many a choice flower not to be found elsewhere. But it is time to proceed with the immediate object of this communication,

which is, to suggest a new application of grafting or inarching, the process usually adopted in India. Grafting, it is well known, is a very ancient art. Formerly it was more practised to astonish the ignorant than for any really useful purpose, but in modern times, it is rarely employed except to gain some desirable object, such as rendering trees fruitful, improving the qualities of the fruit, preserving or rapidly multiplying the finer varieties of fruit-trees, or ornamental trees and shrubs, changing the sorts of fruit on any tree, and many others. The new application to which I wish to call attention, is that of rendering it a means of naturalizing new fruits among us.

It is well known, that many trees brought from countries not very distant, will not grow, say for example, in gardens at Madras, or if they do grow, will not perfect or even bear fruit. The failure is usually attributed to the uncongenial climate and considered irremediable. Of course no steps are taken to remove an obstacle believed insurmountable, to change the climate of a country, being indeed far beyond the reach of human ingenuity. So long as such an opinion prevails every new attempt will only tend to confirm it, by an additional failure. Before however adopting such a discouraging opinion, we ought to satisfy ourselves, that we have carefully guarded against every source of fallacy that might tend to mar the success of our experiment. Subject as we all are, in this country, to frequent change of place, it has fallen to the lot of few, to enjoy opportunities of conducting such a course of experiments to a successful conclusion, and to fewer still the requisite degree of skill and knowledge of vegetable physiology. Now however, times are changed. The formation of a society in some measure pledged to the undertaking, having an experimental garden under its control and among its members talented men, fitted by tastes and previous pursuits, for conducting such an experimental inquiry, to a successful termination, if success be attainable, or if not, of setting such questions at rest for ever, we have no longer any excuse for leaving them in doubt.

It appears to me that there is room to doubt the correctness of the opinion which attributes failure to change of

climate alone, as it is well known, that fruit trees, which have been barren for years, have at once become fruitful on the soil being changed. The records of horticulture present numberless cases of this kind. That change of climate or exposure had no influence on the result is proved by the trees not being removed from the spot on which they originally grew. It is equally on record, in the annals of horticulture, that whole borders have been nearly unproductive until by artificial means the trees were prevented sending their roots into an uncongenial subsoil, when an immediate change took place, both in the quantity and quality of the fruit produced. Such cases, and they are neither few nor far between, affording undeniable proof of the great influence exerted by soil, on both the health and productiveness of fruit trees in their native country, there can be no difficulty in allowing it in the case of exotics, an equal if not a greater power. We may even go a step farther I think, and broadly assert that if the tree attempted to be introduced is a tropical plant, that the chances against success, depend more on the soil than on local differences of climate. On these grounds, I would urge on the attention of the society, the propriety of, as early as possible, commencing a course of experiments illustrative of the respective influence of soil and climate in counteracting the successful introduction of useful plants, as well as, on their influence in increasing or diminishing their produce.

To gain this information, I would suggest as one of the means to be tried, that of grafting, the trees under experiment, on hardy country stocks, that are known to thrive in nearly all kinds of soil, and observe, whether such scions are more healthy and productive than the parent trees. My attention was first called to the subject, by observing the number of thriving and fruitful trees, introduced at Courtallum, though of species usually most difficult to manage, a result, which I am inclined to attribute mainly to the peculiar fertility of the soil, without however, wishing to detract in the slightest degree from the excellence of the climate. The only precaution to be observed, as indispensably necessary to success in grafting, is that of always using stocks, of the same genus or natural order with the scion to be grafted. The

cocoa for example one of those introduced at Courtallum may be transferred to a stock of bastard cedar (*guazuma tomentasa*) one of the most common Indian trees, found in every kind of soil and situation. The mangosteen (*garcinia mangostana*) which also grows well, and bears fruit at Courtallum, may be grafted on the common Pinny marum, (*calophyllum Inaphyllum*) but still better on some of our country species of Garcinia, which though not so common and hardy plants as the Pinny, yet grow and bear fruit in our gardens, indicating suitableness of the soil.

The Pimento or all-spice also growing at Courtallum might be readily transferred to any of our numerous myrtaceous plants, with every chance of success, and possesses the additional recommendation of forming a handsome tree, and so very fragrant that it scents the air to some distance around. The orange which rarely produces good fruit except in alpine or subalpine situations might be grafted on lime or pumplemose stocks, both of which are known to bring their fruit to perfection, and particularly the last, even on the sea coast, with I think every chance of success, as I cannot help thinking, from having met with exceptions to the general rule, that the deterioration of the fruit on the plain is principally owing to the unfavourable kind of soil. Of the olive tribe, which I am surprised has not yet been introduced or even so far as I know attempted, we have several indigenous species, on which the true olive might be grafted, if found necessary, which I doubt, as it is known to bring its fruit to the greatest perfection in the driest and hottest parts of the south of Europe, and thrives well in Egypt and Syria, and is besides of Asiatic origin, though now best known as a European plant. Our figs which are always greatly inferior both in size and flavour to those produced in the south of Europe, the Levant and Tripoli, might perhaps be greatly improved by grafting on some of the numerous indigenous species of that genus.

I have now I trust said enough in illustration of my recommendation to induce the Horticultural Society to institute a series of experiments on the subject. Should they succeed, and I can see no reason to anticipate failure we may all in the course of a few years enjoy the luxury of drinking cocoa

for breakfast, the produce of our own gardens, of having our deserts enriched with mangosteens, fine oranges, and figs, and perhaps olives equally the produce of our gardens; besides many other good things which will be successively tried as the principle which I advocate becomes better known, and the practice founded on it generally adopted. Coffee might equally form an article of domestic supply, as it can with a little care, be cultivated and of very fine quality, on the plains of the Carnatic. The care required is not very great amounting only to sowing the seeds in a cool shady place, and afterwards transplanting the young plants into a good soil, sheltered from the direct influence of the land wind. So situated they thrive well, and form a truly ornamental as well as useful addition to the garden, and in their turn afford shelter to other things requiring such protection. With these suggestions for the practical application of botanical science to our daily wants, I conclude this communication, and hope it may be the means of eliciting others of greater value from men gifted with more practical knowledge than falls to the lot of your obedient servant.

ROBERT WIGHT.

PALAMCOTTAH, 30*th October*, 1835.

P. S.—As a cordial friend, and a sincere well-wisher for the prosperity of the Horticultural Society, I shall with your permission avail myself of the present opportunity, to recommend for the consideration of the society, the propriety of publishing quarterly, reports of its proceedings in the journal, as well as in the less stable columns of a newspaper. A regular series of such reports might in a few years be rendered a valuable record both of useful facts established on the soundest basis, successfully conducted experiment and observation, and of fruitless attempts at improvement, often not less useful, in saving expense and labour, by preventing others going over the same ground, on the supposition that it remained untrodden. Such reports might besides serve as so many guides for other societies in different parts of the country, having similar objects in view, and lastly they would enable its friends far and near to watch over its progress, study both the good and bad points of the system pursued,

point out its defects, and suggest remedies for their correction, in that way exerting a wholesome control over the proceedings of the managing committee alike beneficial to all parties, by the confidence which publicity establishes between the representative and represented bodies. These are all objects of the first importance to the well-being of the institution, but scarcely attainable from the ephemeral existence of newspaper reports which are usually barely read, perhaps scarcely glanced over and thrown aside to be no more thought of as if they had only been published to fill a corner of the paper, or intended to kill the passing hour. But were it otherwise, it rarely happens that newspapers can find room for reports so full and comprehensive as to stamp them with a permanent value in a scientific point of view, both of which objects might be attained through the medium of the journal.

IV.—*On the cause of the Land Winds of Coromandel.*—*By* ROBERT WIGHT, ESQ. M. D. *Surgeon.*

" This peculiar dryness which has been long remarked, but never so far as I can learn, have accounted for, is I think satisfactorily explained on the principle already mentioned, the change of capacity for moisture which the air undergoes, in passing from a colder and more condensed state, to a warmer and more rarified condition : a principle, which probably increases the intense dryness of our hot land winds and perhaps assists in some degree in explaining their origin."

Observations &c. Mad. Jour. vol. 2d, p. 381—2.

Of the correctness of the Theory proposed in the above extract, my valued and talented friend Mr. Malcolmson has, in a letter, expressed some doubts. These have induced me to reconsider the subject, and as the result tends strongly to confirm my views, I propose offering some further remarks in explanation of them. Mr. M. observes " according to your theory the great dryness and heat of the country, would be left out. The winds are really dry, and not only apparently so, for although they produce great cold, they will cause no dew on Daniel's Hygrometer, when they blow at Hyderabad, as I tried it for several days."

This experiment though correct so far as it goes, is I conceive, one of those most apt to mislead, and thereby impede the attainment of just views in science, by not guarding against the sources of fallacy to which it is exposed. According to the theory I ventured to propose, the heat and dryness of the country necessarily form one of its elements, by rarifying the super-incumbent stratum of air, and causing as it were, a partial vacuum giving rise to a rush of cold moist and dense air from the mountains, to equalize the pressure. The cold air of the mountains mixing with the heated air of the plains, becomes in its turn rarified, and in the same proportion has its capacity to absorb and retain moisture increased. This or something approaching to it, if I mistake not, is the commonly received opinion, but has hitherto been considered unsatisfactory on account of occasional anomalies which it either does or seems to present. I stated that the remarkable dryness of the air at Courtallum had been long observed but never satisfactorily explained. The explanation I gave, I still consider correct, because the same wind which is cool and even loaded with moisture there, has acquired the heat and dryness, peculiar to the land winds, by the time it reaches Palamcottah, only 30 miles distant, thus proving the truth of the theory by demonstrating what has hitherto been matter of conjecture only. I certainly have not put it to the test of experiment, because I had it not in my power, but I have no hesitation in stating as my conviction, that if tried in the usual way at Courtallum, there would be a copious deposition of dew proving the supposed dryness only apparent; while at Palamcottah the instrument would indicate nearly absolute dryness, the same as at Hyderabad. I say, if tried in the usual way, for in using the instrument both balls are equally exposed to the current of air. If the air is only moderately rarified as at Courtallum from its proximity to the cool and moist atmosphere of the Malabar monsoon, its capacity for moisture is but little increased, and the reduction of a few degrees of heat would produce a more rapid deposition, than the simultaneous evaporation would remove, but at Palamcottah in similar circumstances, owing to the more highly rarified state of the air, and its greater capacity

for moisture, the deposition would be slower, and the evaporation so much quicker, that the one would counterbalance the other and indicate a state of perfect dryness. Our reason informs us this is impossible, and consequently, that there must be some source of fallacy, either in the instrument or in the mode of conducting the experiment,which has not been guarded against. Such I conceive to have been the case in Mr. Malcolmson's experiments, and believe that we must before we can arrive at accurate results isolate the dry or naked ball of the instrument, so as to prevent, rapid evaporation from its surface, since the same cause acting at the same time, on both balls of the instrument, must necessarily produce the same effect on both, namely, evaporation, and if the evaporation equals or exceeds the rapidity of deposition, absolute dryness will be indicated though the case may be far otherwise. The correctness of the theory therefore remains unaffected by these experiments, while to my mind the facts adduced in support of it leave no doubt of its affording the true explanation of the cause of the hot land winds.

Between the meridians of Courtallum and Tutecoreen, we can actually trace them from their origin to their termination. The same causes are in operation from Cape Comorin to the head of the gulf of Cambay. So long as the southwest monsoon prevails, the temperature on the west coast is considerably lower than on the east, and the air loaded with vapour, and so long is the whole country to the eastward of the Malabar mountains subject to visitations of the land winds; more or less modified by local causes; but the principle is the same throughout, and similar in kind to that which produces the changes of the monsoons themselves; namely, the action of solar heat, on extensive tracts of country, producing local atmospherical rarification, and its consequences a rush of denser air to restore the equilibrium from parts not subjected to the same influence.

Palamcottah, 31*st October*, 1835.

Note.—Since writing the above I find in Myers' System of Geography a reference to "Roxburgh's Essay on the Land Winds of Coromandel." This essay I have not seen,

nor do I know where it is printed, so that I am unable to refer to the opinions of that illustrious author beyond the short extract in Myers' work, which only treats of their heat. He (Roxburgh) mentions 115° as the highest he had ever seen the thermometer, but adds "that some say they have observed it at 130 degrees" during their prevalence.

2d Nov. 1835.

V.—*A brief notice of some of the Persian poets.—By Lieutenant* Newbold, *23d Regiment M. N. I.*

(Continued from Vol. ii. page 254.)

Abúl Olái Ganjawi.

ابوالعلاي گنجوي

This poet was the preceptor of Khakáni and Fáleki; against the former of whom he wrote some satirical verses which are adduced by Hamdallah in his chapter on poets in the *Tarikh-i-Guzidah.* They form one among the many specimens of the impure style of Persian writers.—Khakáni, stung to the quick, vowed vengeance on the author, who however, averted from himself the probable consequences of his own imprudence by the timely production of some conciliatory stanzas, and bestowing the hand of his daughter in marriage, on his irritated pupil. Mahomed Bakhtáwer Khan, in his *Tazkirat-us-Shora,* mentions that Fáleki, jealous of Khakáni's good fortune, retired in disgust from the world. Abúl Olái, when he heard of this, sent Fáleki a thousand *direms,* telling him that "such a sum would be sufficient to purchase forty beautiful damsels, each far preferable to the daughter of Abúl Olái."

Abúl Olái flourished in the sixth century of the Hejira: among his compositions is a *Diwan* which is highly spoken of by Persian writers. His *Pand-i-Arjaji* contains some elegant and fanciful poetry.

Abu Bekr Cazoini (of Cazoin in Jebal).

ابو بكرقزويني

Cazoini was the author of a *Zafer-nameh.* He died A. H. 758.

Abúl Feraz Sanjari.

ابوا لفرازسنجاري

A poet of repute who flourished in the sixth century of the Hejira, during the reign of Sultan Sanjar, sixth monarch of the Seljucides.

Ahmek or Abúl Najib al Bokhtari.

احمق

Ahmek was surnamed *Ustad-us-Shora,* preceptor of the poets; he nearly attained the age of 100 years and flourished during the reign of Khizr Khan Seljúki in the fifth century of the Hejira. Ahmek was the chief of the hundred poets whom Khizr Khan entertained at his court. He excelled in the composition of odes.

Assaberi Razi.

الصبري راضي

Flourished in the reign and resided at the Court of Mahmùd Sabactagi.

Abùl Nazam Mahommed.

ابوا لنظام محمد

Surnamed *Fáleki,* and styled *Shems-us-Shora,* the sun of the poets, also *Malek-al-fazala,* prince of the learned. The compositions of this poet are preferred by Oriental writers to those of his contemporaries, Khakáni and Zahir.

He was a pupil of Abúl Olái Ganjawi, and native of Shamakhi in Shirwan, where he died A. H. 577—"having rendered himself the wonder of the age by upwards of forty thousand excellent verses." It is said that he owes the appellation *Fáleki,* celestial, to his profound knowledge of Astronomy. Herbelot thus remarks—

"L' on donne le surnom de Feleki à nôtre poete, à cause, dit on, du commerce qu'il eut au sujet de ses amours, dans la maison d'un Astrologue, qui lui fit naitre le desir d'apprendre l'astrologie que les Arabes appellent Elm al Felek, la science du ciel. Il fit de si grands progrez dans cette science, qu'il composa même un traité intitulé Ahcam Nogiaum, des

jugemens astrologiques, ouvrage fort estimé par les gens de cette profession.

L' on dit que ses amours le porterent à un si grand excez de melancholie, qu'il resolut de rompre tout commerce avec les hommes, et de se retirer dans le coin d'une maison ecartée, qui étoit a l'extremité de la rue où logeoit sa maîtresse. Il y composa d'abord ce quatrain qu'il lui envoya, où il s'addresse au vent qui passoit devant sa porte, avant que d' arriver au logis de sa dame, et il lui dit :

" La rançon et le prix de ma vie sera ta recompense, si dans le moment que tu passeras devant le logis de ma maitresse, tu lue dis ces paroles.

J'ay vû en passant, au coin de cette rue un amant éperdu ; qui pressé de l'extrème desir de vous voir est sur le point de rendre l'ame."

Un jour ayant appris que la personne qu'il aimoit, etoit dans son voisinage et qu'elle lui donnoit part de son arrivée, il essuya ses larmes ; et passant tout d'un coup à une extrème joye, il chanta ces vers :

" Le plaisir que j'ai senti entendant seulement le bruit de vos pas :

O vous qui assassinez sur les grands chemins le bon sens de tous vos amants,

Passionné que je suis de voir l'unique objet de tous mes souhaits ; apres mil momens languissants d'une foible esperance,

Ce plaisir, dis-je, a laissé enfin échapper mon cœur sur les prunelles de mes yeux, et a fait courir toute mon ame à la porte de mon oreille."

It is strongly suspected that Fáleki did not long continue faithful to his Astrological studies after discovering the stars of his destiny in the light-shedding eyes of his mistress ; at all events authors are agreed on this, that he entirely forsook the dry and tangled paths of mathematical lore for the flowery meads and verdant regions of poesy.

Abúl Fereh.

ابوالفرج

An excellent poet, native of Sejestan ; hence frequently termed Sejestáni.

Abu Ishak Atimah Hallaj Shirázi, (of Shiraz).

ابوسااحا ق اطعمه حلاج شـــيرازي

Shirázi was one of the courtiers of Sultan Secunder, Bin Sultan Amir Shaikh, Bin Amir Timur. He died A. H. 827. It is said that he had a very long beard and on one occasion when he appeared at the Sultan's table, after an absence of some days, he answered, in reply to a question of the prince as to the cause of his absence, "Oh sire, your slave has been employed one day in dressing cotton, and three days in plucking the shreds from his beard." The word Hallaj, حلاج in Arabic signifies a dresser of cotton, to which occupation our poet owes his surname and to which he alludes in his answer; as a hint, no doubt, for the prince to make him independent of so low a vocation for his support.

Ozuri.

آذ ري

This poet was an inhabitant of Asgharain. He wrote an ode in praise of Shah-rukh-Mirza, and subsequently entered into the service of Shah Niamet Allah Wali, by whom he was esteemed and treated with great regard. He performed the pilgrimage to the holy city on foot three times; and there compiled the work, *Sái-us-Sefa.* سعي الصفا He also travelled into Hindustan whence he returned to Khorassan. He died A. H. 966 and was interred at Asgharain.

Asefi.

آصفي

Asefi was the son of Diwan Khájeh Naim uddin, Vizir of Sultan Abu Sáid: he retired in disgust from the court of this monarch and spent his days in peaceful tranquillity and content, at Herat where he died A. H. 920.

Agahi Khorassáni (of Khorassan).

آ گهي خراساني

Khorassáni was a poet of some note, partly from his compositions and partly from the circumstance of being deprived of his right hand and tongue, by order of Amir Khan Turko-

man, Hákim of Herat. It is said that he afterwards recovered the faculty of speech, and was able to write better with his left, than he had done previously with his right hand. He died A. H. 832.

Akadsi Mushahedi.

اقدسی مشهدي

This poet was one of the courtiers of Shah Abbas and of a good family. He died at the early age of 36 and was buried at Cazvin. He composed a *Saki Nameh.*

Abu Terab Beg Ferkati.

ابو تراب بیگ فرقتي

Ferkati flourished in the reign of Shah Abbas; and, according to native authority, was the first poet of his time: preferring retirement he quitted the Court. "The lamp of life of this enlightener of the banquet of literature became extinct at Ispahan A. H. 1007.

Arifi.

عارفي يا ملا عارفي

Arifi, commonly styled Múla Arifi, flourished in the reign of Shah-Jehan. He composed a *Diwan,* and a *Masnawi* called *Mihr-wa-Mah,* the Sun and Moon.

Mahomed Afzel, in his *Tazkiret-i-Sirkhúsh* gives a brief account of this poet.

Abid.

عابد

Abid also lived in Shah Jehan's reign: his real name was Khajeh Abdurrahim. He is author of a *Diwan.* Mahomed Afzel relates an answer, which he made in verse, to an attack of Abid on the manners and morals of the Dervises, of which body Afzel professes himself to have been a member.

Ashrof Khan Mushahedi.

اشرف خان مشهدي

Mushahedi is said to have been a great favourite of the Em-

peror Akber and to have possessed a masterly talent for composition.

He was a proficient in the seven styles of penmanship; but, eventually, his biographer observes, "the penman of fate and scribe of predestination drew the pen of mortality over the page of his existence in the 1009th year of the Hejira."

Ashki Kumi.

اشکي قمي

Kumi flourished in the 11th century of the Hejira and died at Agra. He was celebrated for the imagination evinced in his poetry.

Ashrak.

اشراق يا ميرباقر داماد

Ashrak, or Mir Bakir Damad, was distinguished by his zeal in instructing his disciples in poetical composition, and was universally esteemed for the numerous excellencies with which he was endowed.

"The bird of his life having escaped from its cage, the body, flew away to the branch of eternity." This event took place at the city of Ispahan A. H. 1040.

Abdurrussúl Cashmiri (of Cashmir).

عبدالرسول کشميري يا استغنا

This poet was surnamed Istighna. He lived in the service of Shah Sheja as *Darogheh* of the *Noubet Khaneh*, and distinguished himself by considerable ability and talent.

Subsequently he entered the service of Sultan Akber Shah as superintendent of his household.

Assir Lahóri, (of Lahore).

اسير لاهوري

Lahori flourished in the 11th century of the Hejira. The following anecdote is related of this poet: "It chanced one day that his mistress fell asleep with her hand cast carelessly under her cheek. When she awoke the mark of her

taper fingers remained distinctly imprinted on the delicate rose leaf of her skin.

Assir on seeing it produced the following impromptu :—

بيت

دست بزير روی خود ما نده شبي بخواب شد

عارضش از نشان آن پنجه آفتاب شد

One night through fatigue she fell asleep, her face resting
on her hand:
Her cheek from the impression of those fingers resembled the
sun amidst its rays."

Asaf Kumi.

آصف قمي

This poet flourished in the 11th century of the Hejira. He left his own country for Hindustan where he adopted the habit of a Calendar.

He composed a *Diwan*, said to contain three thousand couplets. The following is a couplet describing the state of a lover, who pines in silent despair :—

بيت

شعله ايم امازدود دل سيه پوش شديم ما

چون چراغ لاله بي سوزيم و خاموش شديم ما

We are a flame; but, from the smoke that arises from our
hearts, are clad in black:
And like the lamp of the tulip consume in silence.

By Persian poets the tulip is frequently alluded to as the "Lamp of the rose garden;" the "Taper of the parterre."

Afseri.

افسري يا شيخ كمال

This poet flourished during the reign of Shah Jehan and was accounted one of the most original writers of his time.

He celebrated the victories and exploits of the Emperor in ten thousand couplets. His true name is Shaikh Kemal.

Aijaz Akber Abádi.

اعجاز اكبر آبادي

This poet flourished in the 11th century of the Hejira and

was noted for the elegance of his language and beauty of his poetry. He is also known under the appellation of Mahomed Said.

Adhum Mirza Ibrahim.

ادهم يا ميرزا ابراهيم

A short *Diwan* and *Saki Nameh* are from the pen of this poet; the style of the latter is much admired by Oriental literati for its elegance and spirit. He originally came from Hamadan in the reign of Shah Jehan.

Amaidi Tehrani, (of Tehran).

اميدي طهراني

Tehrani was accounted as the first poet of Iran in the time of Shah Ismail, who flourished in the 10th century of the Hejira. In early life he repaired to Shiraz and was taken into the service of Moulana Jelal, where he made rapid progress in the sciences. The surname *Amaidi* (hopeful) was given him by his master.

He finally settled at Tehran where he made a garden and called it the *Bagh-i-Amaid,* the garden of hope, in allusion to his surname: but alas! (to use his biographer's words) "the young plant of expectation had not yet produced the fruit of his wishes, when the rose-garden of life became withered and blighted by the chilly blast of death."

The following verses of Akhsangi, (mentioned in our last) have been preserved as a specimen of the style of that poet by the author of the Tazkirat-us-Shora :—

اي شمع زرد روئي كه با اشك ديده
سرخيل عاشقان مصيبت رسيده
فرهاد وقت خويش نه مي سوزي گداز
تا خود چراز صحبت شيرين بريده
ياري بباد داده ارنه چراچو من
بد رنگ و اشك بار و نزار و خميده

"Oh Taper, yellow-faced, with tearful eye, chief of
misfortune-overtaken lovers,
Farhad of thy time, burn on and melt.
Why hast thou separated thyself thus long from sweet
society (or the society of Shirin)?
Friendship thou hast thrown to the winds: if not,
why like wretched me, art thou pallid, shedding
tears, emaciated and bent down?

The following translation of a similar effusion, from the Arabic, is from the pen of the ingenious Carlyle:—

"The wasting taper when I see;
I cry poor fool our lot's the same
I bear a raging fire like thee,
Yet dread whate'er would quench the flame:
Like thine with tears this face o'erflows,
And bleached and wan these cheeks appear;
Like thine these eyes no slumbers close,
Like thine a melting heart is here."

Bhai uddin Zanjáni Khan.

بهاءالدين زنجاني خان

This poet was the panegyrist of Shems uddin Khajeh, and noted for the habit of introducing Turkish phrases into his compositions.

Badakshi.

بدخشي

A native of Badakshan contemporary with Caliph Makhtafi. He is the author of a *Diwan.*

Bushkir.

A Persian poet of whom no mention is made by Dowlet Shah. Herbelot cites the following verses of his composition:—

"Ne vous faites jamais un ennemi sous couleur que vous avez beaucoup d'amis: car entre mille que vous conterez de ceux-ci, à peine s'en trouvera 't il un seul veritable."

Bhai Jami.

بهاي جامي

Not the celebrated Jami, was the panegyrist of Khajeh

Shems-uddin Diwan and other nobles. His poetry was in esteem and abounds in finely drawn and delicate allusions. He died in the reign of Aboka Khan eighth Emperor of the Moguls in the seventh century of the Hejira, having nearly arrived at the age of ninety.

Bisáti Samarcandi, (of Samarcand).

بساطي سمرقندي

This poet was first called *Hasiri,* but one day Moulana Usmat Bokhári said to him, " Hasir (حصير a mat) is not fit for great men, 'twere better we call you *Bisáti,*" (or him of the carpet) the word *Bisat* signifying a carpet. Bisati lived during the reign of Sultan Khalil, Ibn Sultan Miran Shah and died A. H. 815.

Bekasi Ghaznavi (of Ghazneh, a city in Zabulistan).

بيكسي غزوي

Ghaznavi was a courtier of Humaiun Padshah. On the decease of this monarch the nobles and officers of state thought it advisable to conceal the circumstance of his death. Some days after, the news got wind; and the populace having assembled much disturbance and tumult took place. The nobles, to appease these clamours, determined to invest our poet, who bore some personal resemblance to the deceased monarch, with the royal robes and present him to the people. Ghaznavi, gorgeously dressed was shortly conducted to a lofty part of the palace, where the king " who had obtained mercy," (lit. died) was accustomed to sit. Having turned his face towards the populace he sat perfectly composed until their suspicions were allayed. Ghaznavi after this performed a voyage to Mecca and to Hindustan. He lived to return to his native land.

Bekhud Jami.

بيخود جامي

This poet is known as being the author of a *Diwan* containing nearly fifteen thousand couplets, comprising various

detached pieces of poetry, such as *Kassidehs, Gházls* and *Kitas*. He wrote the story of *Husn wa Dil* by desire of Namdar Khan. Jami was celebrated for his skill in versifying dates computed agreeably to the *Abjad* system of notation.

Baka.

بقا یا ، محمد بقا

Mahomed Baka was a man of considerable genius, and well versed in the circle of sciences. He assisted Mahomed Bukhtawer Khan materially in the compilation of his *Shigurf-Nameh.* He died in the office of *Bakshi* at the city of Sharpenúr A. H. 1094.

Cazi Nizam uddin Isfaháni (of Ispahan).

قاضي نظام الدين اصفهاني

This poet flourished in the 7th century of the Hejira during the reign of Abaka Khan. He composed well both in Persian and Arabic. A poem in praise of Khajeh Shems uddin, Sahib-i-Diwan, is from his pen.

Cazi Osman Maki Cazvini (of Cazoin).

قاضي عثمان ماكي قزويني

The poems of Cazvini are said to be copious and written in a flowing style: on account of the ill treatment he experienced from his cousin, Moulana Syed Cazi Razi uddin, he wrote a satire against him and named it "*Razi.*" He was of a generous and liberal disposition, bestowing freely whatever he acquired by his profession.

نظم

صباحد مي که از رخت بر فکني کلاله را

چشم ورخت خاجل کند نرگس ، مست لاله را

گرز خيال چهره‌ات عكسي فتد بجام مي
مستي چشم مست تو مست كند پياله را
خورشيد ديده باين صورت خود در آينه
خرمن مشك بايدت بازگشا كلاله را
مهر و وفا گدا شدي تا بخم رضا نگاشتي
هيچ نگه نداشتي عاشق چند ساله را

In the morn when thou puttest aside the tresses that conceal thy face,
Thine eye would shame the sleepy Narcissus and thy cheek the tulip.
Should the reflection of the shadow even of thy countenance chance to fall on the wine cup, the intoxication of that languishing eye would inebriate the goblet.
Were the sun to gaze in a mirror the image that presented itself would not be so dazzling as thine.

Dakiki.

دقيقي

Dakiki flourished in the reign of Noah or Nuh Samáni, fourth king of the Samanian dynasty, who commenced to reign A. H. 332. He was commissioned by this monarch to form the ancient historical records of the Persians into a national poem, and had completed a thousand couplets when he was assassinated by one of his own servants. It was partly from these materials that the immortal Firdousi arranged the first part of his celebrated epic the Shah-Nameh.

Dái Shirázi (of Shiraz).

داعي شيرازي

Shirázi was cotemporary with Shah Niamet Allah: his *Kulliat* comprehends nearly forty thousand couplets.

Danchi.

دانهي

Daneh is a village tributary to Nishapore, where this poet

dwelt, engaged chiefly in rural occupations. We find no mention of his compositions. He lived during the reign of Akber and travelled into Hindustan.

Dawai.

دوائي ياحكيم عين الملك

The proper name of this poet is *Hukim Ain-al-Mulk.* He came into Hindustan after performing a pilgrimage to Mecca with Khan Azem. He remained a considerable time in the service of the Emperor Akber and was distinguished by many noble and virtuous qualities.

The specimens of poetry that appear in this notice are chiefly those adduced by the Oriental biographers from whose works the materials of it have for the most part been derived: they will therefore perhaps be little consonant to European taste, but may serve to point out the dissimilarity existing between the *beau idéal* of European, and that of Asiatic poetry. The poetical compositions of the Persians have been cried up too much on the one hand and depreciated correspondingly on the other; their style, generally speaking, is too elaborate, too diffuse, and too full of repetition. Their similes and metaphors, though often beautiful, abound in trite ideas tricked out in a variety of fantastic dresses; and the Persian student, after an attentive perusal of the *Yusuf-wa-Zuleikha,* the *Leila-wa-Majnún* or any other Persian love tale, may perchance discover that the ear can tire of the Nightingale's notes and the senses be nauseated even with the perfume and bloom of the rose. Every allowance however, should be made for national dissimilarity, both in education *artificially* and in disposition *naturally*: this done we shall not too hastily condemn what our relative position precludes us from fully appreciating; as it is certain we cannot view Asiatic composition through the eyes of an Asiatic.

ازدريچهٔ چشم مجنون بجمال ليلي نظر بايست

(Sadi).

"To comprehend the beauty of Leila, we must gaze through the window of the eyes of Mejnun (her lover)."

VI.—*Method of putting music on organ barrels.—By Lieutenant* J. BRADDOCK.

(*Continued from page 354 of the 2d vol.*)

1.—I shall now explain the manner in which the music was put on the organ barrels.

2.—In the first place, the principle on which the proceeding is founded, is this.—Suppose a common tune is to be set: the number of bars it may contain may be 18. 20. 24. or some other number if in common time; or double the number if it be in $\frac{3}{8}$, $\frac{6}{8}$ or triple, or waltzing time. Whatever be the number of bars which the tune may contain, that number is the number of divisions which the circumference of the organ barrel must be divided into, so that when the barrel has completed one revolution on its axis, the tune will be finished, and ready to commence playing again. These divisions must be sub-divided, and as each whole division represents one bar of the tune, the sub-divisions represent crotchets, minims, and the several notes of which the tune consists.

3.—This is the principle: the method in which it was reduced to practice was to procure a plate of copper of about a foot in diameter, on one side of which I drew eight separate pairs of circles, one pair of which only is shown in fig. 1; I divided each pair of circles into 12. 13. 14. 15. 16. 18. 20 and 22 parts, and each of these parts was sub-divided into four parts in one of the circles, and into three parts in the other circle. These two divisions gave the several descriptions of time as C, $\frac{2}{4}$, &c $\frac{3}{4}$, $\frac{3}{8}$, $\frac{6}{8}$, &c. for tunes consisting of the foregoing numbers of bars; and the sub-division of four parts represented the four crotchets in the bar of common time, and the sub-division of three parts the three notes making a bar of $\frac{3}{8}$ or $\frac{6}{8}$ time. These sub-divisions were again divided to provide for quavers, semiquavers, &c. so that from these divisions on the plate when attached to the organ barrel, it is plain that the length or value of each note could be duly proportioned, and that the accuracy with which a tune was set off on the organ barrel would be equal to the accuracy with which the plate had been divided.

4.—It is also plain that from the divisions on the plate the length of any note may be readily ascertained; thus two crotchets may be taken for one minim; three quavers for a dotted crotchet; three semiquavers for a dotted quaver; three crotchets for a dotted minim, and so on for notes of every description.

5.—In fig. 1 it will be seen that a small portion of the circumference of the circles is intended to be left free, which portion is indicated by the lines *a*, *b*: this space is intended for the purpose of making a momentary pause between the end of a tune and its recommencement.

6.—What has been stated refers only to common tunes which an organ barrel continues to repeat until it is shifted or adjusted to play another tune; but as it has been shown that the organ described, provides for playing the barrel continuously throughout its whole length, shifting it horizontally as it revolves on its own axis, it is evident that the foregoing divisions on the copper plate will not answer in this case, because a small portion of the circumference (*a*, *b*) is left undivided. I therefore made another series of circles on the opposite side of the copper-plate, and the divisions on them occupied the full circumference of each circle, but in other respects the divisions were the same as the foregoing.

7.—This plate is mounted on a brass axis, as shown in fig. 2, where *c* represents the axis, perforated at one end to receive the axis of the barrel, and *d* the flaunch of the axis to which the plate *x* is screwed. The pieces *e*, *g*, fig. 1, are both attached to the axis, and are moveable around it. The piece *e*, has a grove in it with a shifting point, *f*, which may be fixed so as to be applied to any circle of divisions on the plate; and the piece *g*, is simply a stop to the shifting point. —*h*, *h*, fig. 2, are screws to keep steady and attach the barrel to the division plate.

8.—The axis *c*, *c*, fig. 2, carries two series of groves *k*, *m*, on it: the one, *k* consisting of 10 circular separate groves to serve as a guide to the barrel in setting single tunes, the other, *m*, being a spiral grove or screw of 10 revolutions intended as a guide to the barrel when putting on it music to play continuously till the barrel shifts. The distance of these

spiral groves from one another is sufficient to enable the barrel during one revolution, to shift horizontally as much as is necessary to present a fresh surface for another spiral row of pins, which are to act on the keys of the organ during the succeeding revolution ;—of course these groves in both cases produce an action on the barrel when fixed to the plate, exactly equal to and corresponding with the action produced by the mechanism and snail wheel (7) page 346 last volume.

9.—In fig. 3, is shown the dividing plate with the barrel affixed to it; the plate is represented at the left hand of the figure, and the axis of the barrel enters the perforated end of the dividing plate axis, and is held fast by the screws, which are represented more distinctly by *h*, *h*, in fig. 2. This figure 3, speaks for itself, it shows the barrel, the key frame above it, the dividing plate, and the piece of music which is to be transferred to the barrel; and the method of transferring it is as follows.

10.—The barrel, made perfectly true and prepared to receive the music, is first put into the organ, and when placed correctly and the snail wheel is properly adjusted, the keys of the key-frame, N, fig. 1, of the plate in the last volume, are pressed down upon the barrel, and a line of marks from the points of the keys is made along its whole length; so that each mark represents the proper position of its own respective key. The barrel is then taken from the organ, and so is the key-frame, and both are placed in a suitable stand with four legs, of which an imperfect section only, is shown in fig. 3.

11.—The point, *f*, fig. 1, is now fixed so as to correspond with the circle of divisions required by the music; and the piece, *e*, carrying the point, and the stop, *g*, are brought into a proper position, which is shown in the perspective sketch fig. 4, where *g*, represents the stop resting on the edge of the front rail of the stand, to which the barrel and key-frame are now supposed to be attached, and *e*, *f*, the point and the carrying piece, which together with the stop *g*, are exhibited in their proper respective places. The point is supposed to be placed at *b*, fig. 1, that is at the commencement of the line of divisions required; and the plate is supposed to be turned

round so as for the point *f*, and the stop *g*, to be in the position represented in the perspective sketch fig. 4. The barrel is now placed so as for the line of marks made on it by the keys, and the line formed by the points of the keys in the key-frame to coincide, as also for the points of the keys and their respective marks on the barrel, to *nearly* correspond. The axis of the barrel is then by the screws *h, h,* fig. 2, securely and firmly fixed to the dividing plate, so that whatever motion the plate may have, the barrel will have the same motion also. The only further adjustment required is, that the keys of the key-frame, and their corresponding marks on the barrels be now made to perfectly coincide by means of the two screws, *a, b,* fig. 3, at each end of the key-frame.

12.—In this position all is ready for transferring the music to the barrel. Suppose the four divisions, to which the pointer *f*, fig. 4, stands in the sketch, to represent four crotchets, and it be required to set off on the barrel two crotchets: the notes, or chords are of course to be taken from the music book, and the proper keys pressed down on the barrel so as to mark it; but at starting, marks being already made, we will suppose the second crotchet to be laid off. The pointer must then be removed to the next division on the plate leaving the stop *g*, where it is, and the plate must be moved downwards till the point strikes against the stop: the barrel also having moved a proportional distance, the keys of the notes to be transferred to the barrel are again to be pressed down on the barrel, and marks again made on it, and the distance of these second marks from the first, will be the relative distance of the crotchet. The same process is to be repeated till the whole tune is transferred. The keys on the key-frame representing notes just as the keys on a piano forte, or finger organ, but little difficulty is experienced in laying down the music correctly, and no difficulty at all after a little practice has rendered the operation familiar. A fixed guide is attached to the frame, and works into the groves *k*, *m*, fig. 2, on the axis of the dividing plate, of course therefore at the commencement, that series of groves is used which the music requires, that is, if it consist of single tunes one of the ten separate groves is employed, but if it be continuous music the spiral grove is used.

13.—The foregoing process is strictly correct for laying off music on a barrel for a piano forte, but there is a peculiarity in the organ that requires further explanation. The piano strikes a single blow, and a single pin on the barrel effects it, and whether the note be a long one or a short one, a pin, simply, is all that is required; but with the organ it is not so. If a note is a long one it must be kept sounding as long as the proper time of the note lasts: for instance, if 3 long and 3 shorter notes were to be struck by a self performing piano, the pins might be arranged as shown in fig. 5; but if they were to be sounded on the organ, they would be shaped as shown in fig. 6, where they are not simply pins, but staples which keep the key *a*, sustained, and the note sounding as long as its proper time continues. Now from examining the spaces between the pins in fig. 5, it will be seen that there is ample room for the point of the key, *a*, fig. 6, to descend between them, and no provision to this end is necessary to be made; but as the true distance between note and note is the same on the organ as on the piano, and as the organ notes are continued sounds and not sudden blows struck by a hammer, as in the other instrument, it follows that if the process before described was not to be modified, were a note to be sounded two or more times in succession, there would be only one continued sound (from the preceding staple ending just where the succeeding one commenced) instead of two or more successive sounds. The key in fact would have no space to fall into, to cut off the sound, and to commence again to produce distinct notes. To hit on some easy practical method to diminish every note* a given space gave me some trouble, but I effected it by means of a parallel rule, the use of which is as follows.

14.—In fig. 4, let *a*, represent a part of the front rail of the stand *x.x* fig. 3: and let *b*, represent the parallel rule attached to it. Suppose that two notes from *c*, to *d*, and from *d*, to *i*, had to be set off on the barrel, the apparatus in its

* The *longer* or *staple* notes are here alluded to, not notes consisting of a single pin, of which of course there are numbers on organ barrels as well as on barrels for piano fortes.

Fig. 1.

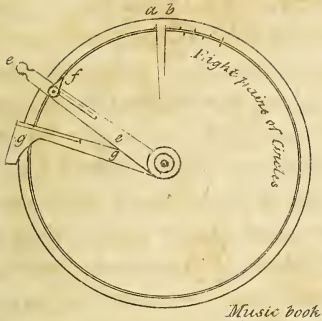
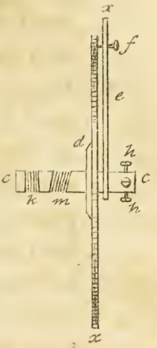


Fig. 2.



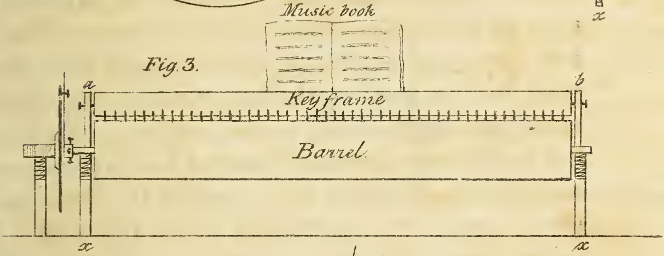


Fig. 3.

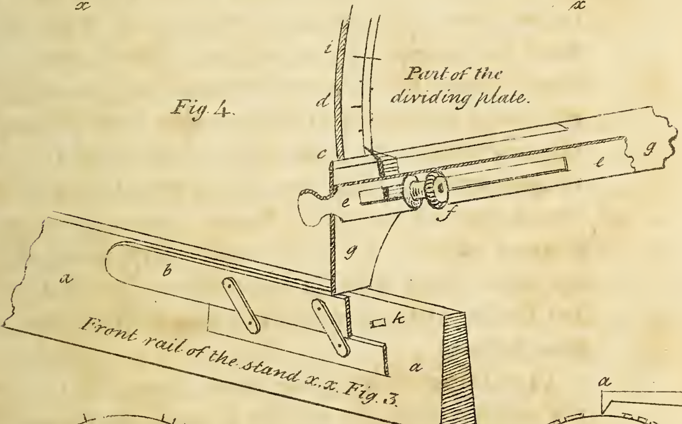


Fig. 4.

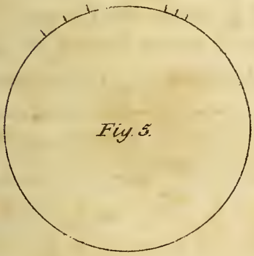


Fig. 5.

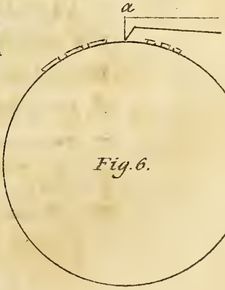


Fig. 6.

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present position would be correct to begin with for marking the barrel with the proper chords according to the music; then the point, *f*, being shifted from *c*, to *d*, the parallel rule must be raised till it stops against the pin, *k*, which would also raise the stop, *g*, a short distance, and prevent it resting as it now does on the rail, *a*. The point, *f*, is then to be brought down till it touches the edge of the stop, *g*, and the note or notes are to be marked on the barrel. The parallel motion after this, must be depressed and brought to the position it now is in, and the stop, *g*, being also depressed till it touches the rail, *a*, the apparatus would be in the same position as represented in the sketch, which is the right position for commencing the note, *d, i;* to mark which upon the barrel would be a repetition of the process just described. On consideration, it will be plain that the effect of the parallel action is to cut off a portion of each note in order to produce space for the point of the key, *a*, in fig. 6, to fall into, so that distinct sounds may be produced when similar notes follow in succession. This quantity, so cut off, does not diminish the proper value of the notes, although it does the length of the staples; for the angular figure of the point of the key compensates for the diminution of length. The space between the notes being only sufficient to allow the key to fall freely, the succeeding note sounds immediately after the one preceding, the breadth of the key being equivalent or nearly equivalent to the intermediate space between note and note, as seen in fig. 6.

5th December, 1835. J. B.

P. S.—From an error in the former manuscript a sentence commencing at the 10th line in page 351, last vol. ought to stand as follows. Now, one piece of mechanism with only one first moving power cannot effect two opposite motions at the same time, namely, a slow movement for the music, and a rapid or slow movement for the bellows, according as the music may require. Slow music generally requires more air, and quick music less air: it would be difficult to provide for these two opposite cases by one piece of mechanism working both the barrel and the bellows, and for the instrument to keep good time.

VII.—*Genealogy of the Kings of the Mahomedan dynasty in Achin, from the* 601*st year of the Hejira to the present time. Extracted from a Malayan MS. entitled* "Adat Achi," *Usages of the Kingdom of Achin; together with a short notice of the MS. itself.—By Lieutenant* T. J. Newbold, 23*d M. N. I.*

The work appears to be divided into four parts. The first, entitled *Parintah segála Rája Rája*, Rules of government for kings—the 2d, *Silsilah Rája Rája di Bander Achi*, Genealogy of the kings of Achin—and the 3d, *Adat Mejlis Rája Rája*, Etiquette to be observed at Court. The 4th and last comprises a variety of regulations for Port duties and customs, also rules for the minor officers of government.

Part the 1st, is subdivided into 31 mejlises or chapters, only eleven of which are to be found in the copy in my possession.

After the customary *Bismillah* and a short exordium consisting of praises to the Almighty, the Prophet Mahomed, his progeny, &c. the author commences his 1st *Mejlis* by attempting to explain the signification of the letters composing the Sanscrit word *Rája* agreeable to Mussulman interpretation. The letter R, he says, has reference to the word *Rahmet*, Mercy—the letter A or Alif ا, from its upright form, to the erecting of the Caliphat on earth by Allah, and the establishment of the *Amr Allah*, commands of Allah, through the agency of kings; and the letter J to the word *Jemal*, beauty. The 2d *mejlis* is on qualities requisite for princes, which are classed under ten heads. The 3d *mejlis* relates to the duties and inclinations of princes, classed under eight heads. The 4th *mejlis* contains rules for the observance of kings on state occasions, when the *Pundits*, princes, ministers, war chiefs, heralds and guards of the kingdom are assembled before the royal throne. These are classed under seven heads.

Mejlis the 5th contains rules to be observed on the breaking up of the Court: it is divided into seven parts. *Mejlis* 6, to 24 are deficient. *Mejlis* 25 contains directions for the war chiefs. *Mejlis* 26, qualifications necessary for the *Bodoanda*, king's guards, under four heads. *Mejlis* 27, duties of

the *Bodoanda*, under five heads. *Mejlis* 28, etiquette to be observed by the *Bodoanda* at Court. *Mejlis* 29, on things prohibited to subjects of the king; both these chapters are divided into five parts. *Mejlis* 30, on honorary titles, of which five are enumerated, viz. *Padúka, Maha, Sri, Raja, Tuan*. *Mejlis* 31, on Ambassadors and their qualifications.

Part 2. *Silsilah Rája Rája di Bander Achi*—Genealogy of the kings of Achin, comprising a historical abstract of the reigns of the (*a*) Mahomedan kings of Achin from the 601st year of the Hejira down to the present time.

Sultan Johan Shah. A. H. 601. This monarch came from the west, "*deri atas angin*," and converted the Achinese to Islam.

He married the daughter of Belodari and settled at Kandang Achin. He died A. H. 631, in the month Rejab.

2. Sultan Ahmed. A. H. 631. Son of the preceding; succeeded his father under the title Sri Sultan Riayet Shah. He died A. H. 665.

3. Sultan Mahmúd Shah. A. H. 665. Son of the preceding—removed in the 43d year of his reign from Kandang Achin to the present site of the city, where he erected the fort, *Dar al dunya*. His death took place A. H. 708.

(*a*) Sir Stamford Raffles observes (Memoirs, p. 384) that from this period 601 A H "until the reign of Secunder,or Macota Alem as he is more generally called, Acheen is said to have been tributary to Rum; it then obtained Maaf, or exemption from tribute. The crown and regalia appear to have been brought from Rum shortly after the establishment of Islamism, and I think it probable that Acheen was the first and most important footing obtained by the Mahomedans to the Eastward, and whence their religion was subsequently disseminated among the islands." The geographical situation of Achin and its early maritime connexion with Western Asia seem favourable to this opinion,although the Malays are fond of attributing the diffusion of Islam as emanating from the ancient empire of Menangcábowe in the interior of Sumatra. The introduction of Mahomedanism may be traced as before observed, in Achin, so far back as 601 A. H.—in Malacca, 675 A. H.—in Java, 883 A. H.—among the Sunda islanders, 885 A. H.—in the Moluccas, 901 A. H.

In the Celebes, according to the records, of Macassar, the Mahometan religion was introduced, about 1012 A. H. by Khatib Tungal Dattu Bandang, a native of Menangcábowe. It was shortly afterwards adopted by the Macassar States. Previous to Mahometanism a species of Buddhism and that rude kind of natural religion common to savage tribes is supposed to have prevailed.

4. Sultan Firman Shah. A. H. 708. Son of the preceding—reigned 47 years, 8 months, and 13 days—died A. H. 755.

5. Sultan Mansur Shah I. A. H. 755. Died, after a reign of upwards of 56 years, A. H. 811, on the 10th of the month Shaban.

6. Sultan Ala uddin Johan Shah. A. H. 811. Succeeded his father Mansur Shah—died A. H. 870.

7. Sultan Hussain Shah. I. A. H. 870. After a reign of 31 years, 4 months and 2 days, this monarch died A. H. 901.

8. Sultan Ali Riayet Shah. A. H. 901.—died after a reign of upwards of 15 years.—A. H. 917.

9. (*a*) Sultan Selah-uddin. A. H. 917. Reigned 28 years, 3 months and 28 days—died A. H. 946.

10. Sultan Ala-uddin. A. H. 946. Brother of the preceding—died A. H. 975, on the 15th of the month Safr.

11. Sultan Hussain Shah II. A. H. 975. Reigned 8 years, 4 months and 12 days—died A. H. 983.

12. Sultan Múda. A. H. 983. This prince was extremely young at the death of his father Hussain Shah, and died after a short minority A. H. 984.

13. Sultan Priáman. A. H. 984. Died after a short reign of 1 month and 22 days A. H. 984.

14. Sultan Rája Jeinal. A. H. 984. Reigned 10 months and 10 days. He was assassinated A. H. 985 on the 10th of the month Mohurram.

15. (*b*) Sultan Mansur Shah II. A. H. 985. This prince

(*a*) Selah-uddin (by some called Ibrahim) was the prince, who, when Mahomed, ex-king of Malacca was blockading the Portuguese in his own city which they had taken possession of, fell upon and massacred all the Europeans in the kingdom of Achin. He proved a most formidable opponent to the early Portuguese adventurers.

(*b*) Mansur Shah, is said by some native authors to have been originally from Perak, a state situate on the western coast of the Malayan Peninsula, and appears to have been confounded by Portuguese authors with Sri Sultan Ala-uddin, or, as they termed him, Sri Sultan Alradin. This prince was foremost in the confederacy made by the eastern powers of India to extirpate the Portuguese who had at this time established themselves at Malacca, and gained a firm footing in the Straits.

Mr. Marsden quoting Diego do Couto and Faria-y-Sousa, states that the king of Achin in conformity with the engagements by which the confederates were

was murdered A. H. 993, after a reign of a little more than 8 years.

16. (*a*) Sultan Buyong. A. H. 993. After a reign of nearly 3 years, this prince was murdered A. H. 996, on the 17th of the month Zualkaideh on Tuesday.

17. (*b*) Sultan Ala-uddin Riayet Shah. A. H. 996. Reigned 15 years, 10 months and 28 days—was deposed by his own son, Sultan Mùda, who succeeded him A. H. 1011, by the title of Sultan Ali Moghayet Shah.

(To be continued.)

VIII.—*Remarks on the method of estimating the distance at Sea, from objects of known height.—By* C.

To the Editor of the Madras Journal of Literature and Science.

Sir,—In forwarding to you the paper upon the estimation of distance at Sea, published in the 9th No. of your Journal, I did not think it necessary to give such a modification of Lieutenant Raper's formula, that the computation might be effected without using logarithm to seven places, but as it may be of some use, I subjoin the investigation.

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bound, prepared to attack the Portuguese in Malacca, and sailed there with a numerous fleet, in which were 15,000 of his own subjects, 400 Turks, with 200 pieces of artillery of various sizes. After several furious attacks on the place the Achinese were compelled to raise the siege, leaving 3000 slain before the walls. Mansur Shah besieged Malacca during his active reign no less than five times, with the same results; being always foiled by the desperate valour of the Portuguese. Mr. Marsden justly observes, "It is difficult to determine which of the two is more astonishing, the vigorous stand made by such a handful of men as the whole strength of Malacca consisted of, or the prodigious resources and perseverance of the Achinese monarch."

Mansur Shah was murdered by his general Moratiza, together with his queen and many of the principal nobility on the 17th day of the month Mohurrum.

(*a*) Buyong, or the boy, was the son of the only daughter of Mansur Shah, by the king of Johor whom she had married.

Moratiza, afterwards Sultan Ala-uddin Riayet Shah, after murdering Buyong's father Mansur Shah, took charge of the boy during his minority; but, ambition prevailing, he despatched him also and assumed possession of the throne.

(*b*) During the reign of this monarch Sir James Lancaster arrived at Achin, as ambassador from Elizabeth of England, with the first English fleet that had appeared in these seas, and concluded a commercial treaty with the Sultan.

Let A B represent the surface of the earth, and C the angle at its centre, or the angular distance in nautical miles at its surface.

Then the angle $\phi = 180^\circ - C - \overline{90^\circ + a}$

$= 90^\circ - C - a$

and $\therefore \sin \phi = \cos (C + a)$

again by the values as given in the last paper, where we may call the true dip for the height H = D.

Then $\sin \phi = \cos D . \cos a = \cos (C + a)$

and substituting the values of the sines.

$$1-2.\sin^2 \tfrac{1}{2}(a+C) = \overline{1-2.\sin^2\tfrac{1}{2} D} \,.\, \overline{1-2.\sin^2 \tfrac{1}{2} a}.$$

$$= 1-2.\sin^2\tfrac{1}{2} D - 2.\sin^2\tfrac{1}{2} a + 4.\sin^2\tfrac{1}{2} D.\sin^2\tfrac{1}{2} a.$$

and

$$\sin^2 \tfrac{1}{2}(a+C) = \sin^2\tfrac{1}{2} D + \sin^2\tfrac{1}{2} a - 2.\sin^2\tfrac{1}{2} D.\sin^2\tfrac{1}{2} a.$$

as the arcs are small they may be taken for their sines, and therefore

$(a + C)^2 = D^2 + a^2 - 2. D^2 . a^2$ but the last terms must always be very small quantities, and may therefore be omitted.

Then $(a + C)^2 = D^2 + a^2$ and expanding.

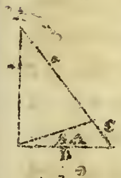
$C^2 + 2. a. C = D^2$ which is of the same form as the trigonometrical formula, for the solution of a quadratic equation, viz. $x^2 + p\,x = q$ therefore substituting the quadritics, we have Tang $A = \frac{D}{a}$ and

$$\text{Root} = C = \text{Tang}\,\tfrac{1}{2} A \times D.$$

Q. E. I.

The same result may be obtained thus, taking the formula $\cos (a + C) = \cos D . \cos a$. it is apparent that it is of the same form as the formula for the hypotheneuse of a right angled spherical triangle, and supposing $a + c$ to represent the hypotheneuse and D and a the other two sides, then C will be equal to the difference between the hypotheneuse and

the side a. But as the arcs must be very small never exceeding two or three degrees they may be represented by straight lines, therefore in the right angled plain triangle



$$\text{Tang } A = \frac{D}{a}$$

$$C = \frac{\sin \tfrac{1}{2} A}{\cos \tfrac{1}{2} A} \times D.$$

$$= \text{Tang } \tfrac{1}{2} A \times D.$$

Q. E. I.

and to apply the values of the quantities before given.

$D = 58' \, 16'' = 3496''$ log. $= 3.54357$

$a = 1^{\circ} \, 58' \, 39'' = 7119''$ colog. $= 6.14758$

$9.69115 = \text{Tang } A = 26^{\circ} 9' 17''$

$\text{Tang } \tfrac{1}{2} A = 13^{\circ} \, 4' \, 38'' = 9.36602$

$D = 3.54357$

$2.90959 = 812'' = 13' \, 32''$.

the same as before, while by this formula, logarithms to five places are sufficient.

20th October 1835. C.

IX.—*Observations respecting* Halley's *Comet.*

My Dear Sir,—It will be interesting to your readers to learn that Halley's Comet is still visible through a telescope, and it will probably so remain for twenty or thirty days to come ; comparing the quantity of light which it at present exhibits with that exhibited before the Peribelion passage it would appear that it has lost no part of its brilliancy whatever by its approach to the Sun (a fact by the way which is at variance with the generally received opinion of astronomers.

We will now for a moment take a look at the past—the Astronomer Halley, 150 years ago could have predicted the present return of the Comet which so justly bears his name to a couple of months ; but it is to the refined astronomy of the present century to which so much honour and

credit is due, that we are enabled to predict its place as has been done in the present instance to a few (six or seven) days. Should there be an individual now in existence who can doubt for a moment the truth of universal gravitation, (on which theory, this as well as every other astronomical prediction is built) it will be as well to shut the book for ever, for nothing further or more conclusive in the way of argument can be urged. Not however to exhibit an impatience which would ill become the defenders of truth of the sublimest nature, it may not be amiss here to explain why the astronomer Halley when calculating upon the same grounds as the astronomer of modern days, could not have predicted to an equal degree of accuracy; and to notice the causes which have given rise to an error of eight or nine days in the present return—to pursue such a question through all its minutiæ would be at once to set down and write a volume; it will therefore be necessary to handle the enquiry rudely, and state off hand, that in the days of Halley the existence of five of the Planets composing the solar system (*Georgian, Juno, Ceres, Vesta,* and *Pallas* were unknown. Since this time likewise, the Comets of Biela and Encke have been recognized as forming a part of our system and several others which are conjectured likewise to belong to it have been observed. Now the effect of every one of these is, continually to draw the Comet from its path and to disturb one another; the amount of the perturbation varying with the time, inversely as the square of the distance, and directly as the weight of the disturbing body; had HALLEY predicted the present return of the Comet, and should it have turned out that he was two or three months in error, so far from throwing any discredit upon his theory (ignorant as he was of the causes now enumerated) it would on the contrary tend much to confirm it; moreover in the days of HALLEY astronomical instruments were rare, and their construction of the rudest possible kind when compared with those of the present day, insomuch so that comparatively little or nothing could be known with regard to the relative weight of the Planets; now in the prediction of HALLEY of the return of this Comet in 1682, he took account only of the action of the planet

Jupiter, which he computed would delay the return by about a twelve-month; had he taken account of the action of the planet *Saturn* the prediction would have been 100 days later, and would have agreed to within a few days of the observed return to the Perigee: at its last appearance in 1759, Clairaut computed that the planet *Saturn* would retard it by 100 days, and *Jupiter* by 511 days, a result agreeing within about a month of the truth. But to return to our own time in which we have the benefit of very superior instruments, together with numerous and well appointed observatories; "what are now the fruits?" In the year 1822, it was found that the map of planet *Venus* had been assumed too small by about $\frac{1}{10}$ and that an equation going through its period in 250 years had been omitted; as late as 1833 the mass of the planet *Jupiter* was corrected from $\frac{1}{1067}$ to $\frac{1}{1049}$ of the mass of the Sun, &c. &c. &c. In 1824 and from that time up to the present, strong suspicions *were* and *are* entertained of the existence of an æther instead of a vacuum, which, extending throughout the solar system, thereby retards the planets in their orbit, (but consider gentle reader, that *if* this æther does exist its density is eight hundred times less than that of atmospheric air!) requiring however many more observations than we at present possess to decide the point. Now in the prediction of the return of the Comet which is just departing (to the most part of us for ever!) the effect of the æther was computed to *accelerate* the return by 13 days, is it then to be wondered at, that a discrepancy of half this amount should occur in a computation clogged with difficulty on every hand, and tedious to the last degree—one which requiring the utmost mathematical knowledge and skill has found a dozen individuals only competent to undertake it? It will be as well now to conclude this subject by exhibiting the elements of the orbit of this Comet as predicted by Pontecoulant, and the same computed by myself* from observations made at this Observatory, thus:

* I take this opportunity of acknowledging my obligations to *Goday Vencata Juggarow*, who rendered me very great assistance in the computation.

	PONTECOULANT.	*From the Madras Observations.*
	D.	D.
Perihelion Passage.	November 7,42	November 16,19
	° ′ ″	° ′ ″
Place of Perihelion.	304·31·43	304·12·10
Long. of the ascend. node.	55·30·0	55·9·16
Inclination of the orbit.	17·44·24	17·49·1
Ratio of the eccentricity.	0·967521	,967632
Semi axis major.	17·98705	17·98705
Motion.	Retrograde.	Retrograde.

With my apology for troubling you with these hasty remarks,

I beg to remain,

Very sincerely yours.

T. G. TAYLOR.

H. C. Astronomer.

X.—*Table for computing the position of* HALLEY'S *Comet.*

SIR,—Having been favoured with the elements of the orbit of Halley's Comet, which have resulted from the observations made at the Madras Observatory during the last three months, I have set to work to compute an Ephemeris of its place for the month of January next year, (when it will be visible to a good Telescope if not to the naked eye) which I beg to forward for insertion in the Madras Journal of Literature and Science. In computations of this nature where the ellipse is very eccentric, the labour of computing the eccentric anomaly from the mean, is by far the most tedious part of the work, to facilitate which, I have herewith forwarded a Table by which it may be taken out at sight, by this means any of your readers may compute the place for any day in half an hour.

I beg to remain,

Sir,

Your most obedient servant,

GODAY VENCAT JUGGAROW.

A Table shewing the Mean Anomaly of HALLEY'S *Comet, corresponding to every* 10 *minutes of the eccentric anomaly.*

Ec. Ayn.		Mean Anomaly.			Diff.	Ec. Any.		Mean Anomaly.			Diff.
°	′	°	′	″	″	°	′	°	′	″	″
0	10	0	0	19·4	19·5		50	0	16	37·7	25·0
	20		0	3 ·9	19.4	8	0		17	2·7	25·2
	30		0	58·3	19.4		10		17	27·9	25·4
	40		1	17·7	19·5		20		17	53·3	25·7
	50		1	37·2	19·5		30		17	19·0	25·9
1	0		1	56·7	19.5		40		18	44·9	26·2
	10		2	16·2	19·6		50		19	10·1	26·4
	20		2	35·8	19·6	9	0		19	37·5	26·7
	30		2	55·4	19·6		10		20	4·2	27·0
	40		3	15·0	19·7		20		20	31·2	27·2
	50		3	34·7	19·8		30		20	58·4	27·5
2	0		3	54·5	19·8		40		21	25·9	27·8
	10		4	14·3	19·9		50		21	53·7	28·1
	20		4	34·2	19·9	10	0		22	21·8	28·4
	30		4	54·1	20·0		10		22	0·2	28·7
	40		5	14·1	20·1		20		23	18·9	29·0
	50		5	34·2	20·2		30		23	47·9	29·3
3	0		5	54·4	20·2		40		24	17·2	29·6
	10		6	14·6	20·4		50		24	46·8	29·9
	20		6	35·0	20·5	11	0		25	16·7	30·3
	30		6	55·5	20·5		10		25	47·0	30·6
	40		7	16·0	20·6		20		26	17·6	30·9
	50		7	36·6	20·8		30		26	48·5	31·2
4	0		7	57·4	20·9		40		27	19·7	31·6
	10		8	18·3	21·0		50		27	51·3	31·9
	20		8	39·3	21·1	12	0		28	23·2	32·3
	30		9	0·4	21·3		10		28	55·5	32·7
	40		9	21·7	21·4		20		29	28·2	33·0
	50		9	43·1	21·6		30		30	1·2	33·3
5	0		10	4·7	21·7		40		30	34·5	33·7
	10		10	26·4	21·9		50		31	8·2	34·1
	20		10	48·3	22·0	13	0		31	42·3	34·5
	30		11	10·3	22·1		10		32	16·8	34·9
	40		11	32·4	22·3		20		32	51·7	35·3
	50		11	54·7	22·5		30		33	27·0	35·7
6	0		12	17·2	22·7		40		34	2·7	36·1
	10		12	39·9	22·9		50		34	38·8	36·4
	20		13	2·8	23·1	14	0		35	15·2	36·8
	30		13	25·9	23·3		10		35	52·0	37·3
	40		13	49·2	23·5		20		36	29·3	37·7
	50		14	12·7	23·6		30		37	7·0	38·2
7	0		14	36·3	23·8		40		37	45·2	38·6
	10		15	0·1	24·1		50		38	23·8	38·9
	20		15	24·2	24·3	15	0		39	2·7	39·4
	30		15	48·5	24·5		10		39	42·1	39·9
	40		16	13·0	24·7		20		40	22·0	40·3

Ec. Any.		Mean Anomaly.			Diff.	Ec. Any.		Mean Anamaly.			Diff.
°	′	°	′	″	″	°	′	°	′	″	″
	30	0	41	2·3	40·6		50		56	9·6	50·8
	40		41	43·5	41·2	19	0		57	0·4	51·3
	50		42	24·3	41·7		10		57	51·7	51·9
16	0		43	6·0	42·1		20		58	43·6	52·4
	10		43	48·1	42·6		30		59	36·0	53·0
	20		44	0·7	43·1		40	1	0	29·0	53·6
	30		45	1[illegible]·8	4[illegible]·6		50		1	22.6	54·1
	40		45	57·4	44·0	20	0		2	16·7	54·7
	50		46	41·5	44·5		10		3	11·4	55·3
17	0		47	26·0	45·0		20		4	6·7	55·9
	10		48	11·0	45·5		30		5	2·6	56·5
	20		48	56·5	46·0		40		5	59·1	57·1
	30		49	42·5	46·6		50		6	56·2	57·7
	40		50	29·1	47·1	21	0		7	53·9	58·3
	50		51	16·2	47·6		10		8	52·2	58·9
18	0		52	3·8	48·1		20		9	51·1	59·5
	10		52	51·9	48·6		30		10	50·6	60·1
	20		53	40·5	49·2		40		11	50·7	60·8
	30		54	29·7	49·7		50		12	51·5	61·4
	40		55	19·4	50·2	22	0		13	52·9	

Ephemeris of HALLEY'S *Comet for January* 1836, *computed for Madras at* 4*h.* A. M.

Day.	Right Ascension in Time.			Declination South.			Time of Rising.		
	h.	*m.*	*s.*	o.	*m.*	*s.*	*h.*	*m.*	
Jan. 1st	16	18	55	24	45	30	4	2	A. M.
11th	16	6	50	24	27	58	3	14	„
21st	15	50	10	30	9	49	2	21	„
31st	15	26	56	32	40	25	1	21	„

Days.	Standard Barometer No. 3, by Gilbert.							Standard Therm. by Troughton.						
	Sun rise.	10 A. M.	Noon.	2 P. M.	Sun set.	8 P. M.	10 P. M.	Sun rise.	10 A. M.	Noon.	2 P. M	Sun set.	8 P. M.	10 P. M.
Sept.	Inches							o						
1	29,918	29,970	29,944	29,894	29,890	29,916	—	81,1	84,9	86,8	89,6	88,4	86,5	—
2	,958	30,006	,956	,896	,888	,952	—	82,3	86,	88,6	90,0	5,3	84,2	—
3	,924	29,938	,928	,870	,878	,918	—	82,0	86,3	88,4	90,0	86,0	86,0	—
4	,904	,930	,908	,872	,830	,856	29,858	83,0	85,4	89,	89,	86,	85,0	83,
5	,886	,901	,866	,818	,800	,821	—	81,8	85,3	87,5	9 ,3	89,0	86,0	—
6	,854	,900	,866	,844	,810	,864	29,924	82,8	85,8	88,8	89,8	88,8	85,3	83,
7	,914	,976	,927	,870	,890	,894	—	8 ,1	86,8	87,5	87,0	83,	84,2	—
8	,916	,954	,928	,890	,899	,897	—	82,0	87,1	91,0	89,3	85,8	85,2	—
9	,942	,974	,957	,902	,888	,934	—	83,3	87,2	91,0	89,4	87,3	86,0	—
10	,924	,960	,956	,916	,868	,880	29,900	80,8	82,8	83,4	83,	82,1	82,9	82,
11	,900	,938	,914	,882	,878	,868	—	82,0	81,9	83,0	85,3	83,8	82,4	—
12	,914	,972	,940	,890	,882	,904	,902	80,4	82,2	83,3	84,7	83,6	82,0	82,
13	,910	,954	,930	,888	,862	,870	,912	81,0	84,0	83,6	5,5	83,8	8 ,7	81
14	,888	,912	,888	,848	,836	,874	—	80,8	83,0	86,	87,8	86,	83,7	—
15	,856	,938	,914	,870	,836	,866	,904	79,2	82,3	83,9	85,8	83,7	82,	81
16	,900	30,002	,990	,950	,930	,980	30,002	80,3	83,0	85,	84,5	83,2	82,	81
17	29,970	,062	30,024	,976	,9 2	30,016	,050	80,	82,6	84,7	84,8	83,2	82,4	82,
18	30,0 0	,076	,020	,964	,946	29,982	,024	78,3	83,6	84,3	85,0	82,9	82,8	82
19	30.000	,050	29,994	,952	,940	,970	,016	80,2	84,4	84,7	85,4	83,0	82,7	82,
20	29,982	—	30,020	,958	,944	,997	,036	79,0	—	84,9	85,4	83,3	83,	82
21	,992	,064	,030	,962	,962	,972	,018	79,6	83,2	84,0	84,0	82,6	82,5	83,
22	,962	29,997	29,968	,908	,872	,924	29,972	79,0	82,9	85,6	87,7	86,	83,5	83
23	,950	30,016	,970	,916	,902	,944	,962	81,9	84,0	85,0	85,8	85,	83,5	83,
24	,950	,016	,980	,936	,904	,946	,980	78,5	87,0	87,7	85,7	84,0	84,0	8 ,
25	,978	,008	,996	,944	,956	,990	30,012	81,0	82,5	84,5	86,0	83,8	83,0	82,
26	30,016	,050	30,004	,960	,972	30,006	,032	78,0	84,5	86,5	86,6	84,3	83,1	81
27	29,978	—	29,968	,938	,912	29,940	29,970	77,	—	85,5	86,6	84,4	83,0	83
28	,944	29,976	,950	,902	,900	,950	,966	77,8	84,6	87,6	86,0	83,9	83,9	83
29	,950	,988	,966	,940	,916	,963	,994	80,0	84,0	87,3	86,0	82,9	82,2	82
30	,960	30,040	,994	,950	,940	,982	30,006	77,3	84,7	85,8	86,6	83,5	82,9	82
Mean.	29,938	29,985	29,956	29,910	29,899	29,931	29,975	80,4	84,3	86,2	86,8	84,6	83,6	82

	Dep. of wet bulb Therm.							Depth of Rain.		Evaporation.	Direction of Wind.	Weather.
	Sun rise.	10 A. M.	Noon	2 P. M.	Sun set.	8 P. M.	10 P. M.	Sun rise.	Sun set.			
1	5,	7,	6.8	9,6	7,5	6,2	—	—	—	—	s.w.w.	Mo. cdy. day and nt. ltng.
2	4,	7,9	9,	9,6	-----	4,	—	—	—	2,507	s.w.w.	Do do do
3	3,7	7,	,4	8,4	4,0	4,0	—	—	—	—	s.w.w.	Do do thr do and rain
4	3,0	7,	9,1	7,4	4,3	3,8	2,7	0,142	—	—	s.w.w.n.w.	Do do do
5	—	6,2	5,5	9,7	9,0	6,0	—	—	—	—	s.w.w.n.w.	Do do do
6	6,8	6,5	6,8	10,6	9,2	3,6	3,4	—	—	—	w.s.w.w.	Mo. clear day and nt. Do
7	3,1	,	8,5	4,5	3,4	3,7	—	—	0,017	—	w.s.w.s.	Do & cdy. nt. ltng. & rain
8	4,0	10,1	11,5	1 ,3	4,6	4,	—	0,031	—	—	s.w.n.w.e.	Do do do
9	3,5	9,7	12,5	10,4	5,4	4,2	—	—	—	2,416	w.n.w.	Mo. cdy.day & nt do th&rn
0	2,6	4,3	3,6	4,1	3,	2,9	2,2	0,222	—	—	n.w.w.	Cdy day & nt ltng & rain
1	2,0	1,9	2,6	7,3	2,5	,4	—	0,014	—	—	s.w.w	Mo. cdy day & nt th lt & rn
2	2,2	2,2	3,6	4,9	2,4	1,9	,1	0,354	—	—	s.w.w.n.w.s	Do do lightning
3	2,8	4,0	6,0	7,5	4,	,7	,0	—	—	—	w.s.w.n.w.s	Do do do
4	2,9	5,7	9,2	9,8	6,9	3,1	—	—	—	—	s.w.n.w.w.	Cdy. th. ltng. & hy. rain
5	1,5	3,0	4,9	5,8	1,7	2,	,8	1,3-9	—	—	w.s.w.n.w.s	Mo.cy.day & clr.nt lg.&rn.
6	,	2,7	5,0	2,5	2,2	0,8	,4	0,052	—	1,545	s.w.s.w.	Mo. th haze at day & nt do
7	1,8	2,0	2,7	2,8	2,2	,4	1,1	—	—	—	s.s.w.s.e.	Mo. cdy. day & clr. nt. do
8	,2	,9	2,3	3,3	1,9	,6	,0	—	—	—	s.s.e.s.w.	Mo. clear day & night. do
9	0,7	2,0	1,7	3,4	---	,4	,6	—	—	—	s.w.s.e.	Mo. cdy day & clear nt do
0	0,6	-----	2,9	3,9	2,8	2,	,8	—	—	—	s.w.s.e.	Mo. clear day & night do
1	3,6	3,8	8,0	4,5	2,8	2,4	2,4	—	—	—	s.w.w.n w.s	Mo. cdy. day and night do
2	2,7	4,0	7,6	7,7	5,5	3,5	2,5	—	—	—	s.w.w.s.	Do do do
3	3,1	3,8	5,4	5,8	4,9	2,3	,4	—	—	—	w.n.w.s s.w	Mo. clear day & clr night
4	2,5	8,4	8,0	5,0	2,8	2,5	,8	1,035	—	—	w s e s.w.s	Mo. clr. dy & nt. thg hy rn
5	1,4	2,4	2,7	3,5	1,8	1,7	1,2	—	—	—	s.w.s.s.e.	Mo. cdy. day & nt ltng.
6	1,9	5,6	6,0	4,6	3,5	2,6	,4	—	—	—	s.e.s.	Clear day & night ltng dew
7	0,2	----	5,5	6,6	4,4	3,2	3,5	—	—	—	s.w.s.e.	Mo. clr. day & nt. lntg.
8	1,9	6,	6,6	6,0	3,6	3,	2,8	—	—	—	w.s.w.s.e.	Do do do
9	,1	4,	6,3	4,5	3,9	2,5	2,3	—	—	—	n.w.w.s.e.e.	Mo. cdy. day & clr nt lntg
0	0,3	4,8	3,3	5,0	3,6	3,2	2,5	—	—	1,368	e.s.e.s.w	Mo. thk haze at day & cdy nt. th lntg & heavy rain
e.	2,4	5,1	6,1	6,3	4,	2,9	2,0	—	—	—		

Days	Standard Baromter No. 3, by Gilbert.							Standard Therm. by Troughton.						
	Sun rise.	10 A. M.	Noon.	2 P. M.	Sun set.	8 P. M.	10 P. M.	Sun rise.	10 A. M.	Noon.	2 P. M.	Sun set.	8 P. M.	10 P. M.
Oct.	Inches													
1	30,032	30,054	30,008	29,950	29,936	29,990	—	80,6	77,0	79,0	82,0	80,0	79,5	—
2	29,960	,026	29,972	,924	,922	,956	29,946	76,3	77,9	80,0	81,6	80,0	79,0	78,4
3	,912	29,938	,900	,860	,860	,870	—	78,0	80,6	82,7	82,9	80,7	79,8	—
4	,890	,960	,932	,900	,894	,950	,990	76,8	79,8	83,0	83,3	82,5	81,[illegible]	1,8
5	,986	30,044	30,000	,960	,978	,990	30,002	79,1	83,4	84,0	84,8	83,2	83,0	81,6
6	,978	,046	29,996	,960	,962	,982	29,994	80,2	83,4	82,2	80,6	78,3	78,8	80,2
7	,982	,050	30,022	,964	,968	,980	30,026	77,6	80,0	80,9	81,0	80.7	79,8	80,0
8	30,016	,058	,012	,956	,950	30,000	—	77,5	81,5	83,6	84,3	82,5	82,0	—
9	,032	,062	,016	,972	,960	,000	,028	78,3	79,9	82,0	82,2	81,1	80,0	78,8
10	29,998	,026	29,984	,940	,946	001	,000	79,3	81,9	85,4	85,0	82,8	82,0	81,9
11	30,022	—	,990	,964	,996	,026	—	78,0	—	84,7	85,0	82,0	78,4	—
12	,000	,096	30,042	30,008	30,015	,060	,040	77,8	81,9	84,0	85,0	81,4	79,2	89,0
13	,010	,052	,004	29,956	29,946	29,980	29,994	77,3	82,3	84,9	85,3	82,5	79.3	79,9
14	29,972	,002	29,970	,940	,942	,950	,972	78,1	83,2	84,0	85,0	83,3	79,6	80,0
15	,950	29,992	,968	,9[illegible]4	,892	,928	,932	78,8	83,1	84,0	86,5	84,3	80,8	80,9
16	,925	'940	,898	,854	,850	,858	,898	80,3	83,8	87,5	87,8	85,4	83,5	83,4
17	,854	'896	,842	—	,800	,850	,862	81,0	84,2	86,3	—	86,8	85,2	84,7
18	,854	—	,874	,836	,858	,872	,910	82,0	—	86,5	90,2	86,0	85,1	84,0
19	,910	,960	,952	,904	,904	,952	,968	82,1	86,1	88,8	91,3	86,0	84,0	82,6
20	,956	30,004	,976	,946	,924	,964	,984	81,2	87,2	90,4	92,0	85,4	82,4	80,4
21	,974	,038	,996	,946	,934	,968	,974	81,7	85,3	86,0	87,2	85,3	80,8	78,3
22	,982	,022	,976	,928	,920	,956	,958	76,5	84,7	85,4	86,5	83,8	79,0	78,0
23	,955	,010	,970	,934	,926	,962	,972	77,5	83,6	83,7	85,4	83,3	79,2	76,7
24	,984	,012	,976	,932	,942	,976	,986	77,9	82,2	85,8	85,6	82,5	80,3	77,0
25	,960	—	,988	,966	,970	30,000	30,018	76,2	—	82,8	82,3	80,1	79,3	79,4
26	30,003	,054	30,028	,996	30,003	,054	,050	76,8	83,7	84,4	84,0	82,1	81,3	80,4
27	,034	,052	,046	30,018	,010	,056	,052	77,2	83,1	83,7	84,4	81,8	80,9	79,3
28	,040	,078	—	—	,002	,028	—	76,3	80,4	—	—	79,8	76,2	—
29	,004	,032	—	—	29,992	,026	—	75,6	80,3	—	—	79,6	77,9	—
30	,008	,056	—	—	,980	,032	—	77,2	78,0	—	—	75,5	76,2	—
31	,018	,034	30,040	29,988	,988	,034	—	74,9	75,1	75,5	78,1	77,9	77.3	—
Mean.	29,974	30,022	29,978	29,941	29,941	29,960	29,980	78,3	81,9	84,0	84,8	82,1	80,4	80,7

	Dep. of wet bulb Therm.							Rain.		Evaporation.	Wind.	Remarks.
	Sun rise.	10 A. M.	Noon.	2 P. M.	Sun set.	8 P. M.	10 P. M.	Sun rise	Sun set.			
1	2,3	1,0	1,o	3,5	1,1	o,5	—	1,486	o,139	—	NW. N. NE.	Cly. d. & nt. ltng. & rain.
2	0,3	1,3	2,6	0,8	o,8	1,1	0,4	—	—	—	NW. N. NE.	Mo. clo. thr. do.
3	0,5	2,8	4,7	4,9	3,3	,9	—	—	—	—	N. NE. E.	do. do. [&rain.
4	o,3	o,9	2,7	1,3	2,2	1,8	1,8	0,118	o,056	—	S. SE. E.	Mo.clr.day. &clo.nt.thr.ltg.
5	o,6	2,9	3,o	3,1	2,2	2,7	1,6	—	o,263	—	E. SE.	Mo.cly. day&nt. ltg.&rain.
6	3,6	3,o	2,7	1,o	o,3	o,2	o,7	—	o,368	—	E. SE NE.	do. do. thr. do.
7	o,1	1,7	2,4	2,o	1,2	1,5	o,5	0,135	o,004	1,191	N. E. SE.	do. do. do.
8	o,9	1,6	3,6	2,8	2,3	1,7	—	o,o1o	—	—	SW. S. SE. E.	do do th do &hy r at n
9	2,o	0,3	2,0	2,2	1,1	o,7	1,2	3,958	—	—	SW. NW. W.	Mly.cly.day&clr. night ltg.
0	1,1	2,o	5,7	5,0	1,8	1,9	1,9	—	—	—	N. NEE.	My.clr d.&cy nt th lg&hy rn
1	2,o	—	5,4	5,0	4,o	1,6	—	—	—	—	NW. N. NE.	Mly .cly. day & night ltng.
2	1,7	5,2	8,8	,0	6,4	3,2	3,0	—	—	—	NW. NE.	do. do.
3	1,7	3,1	7,9	6,1	4,7	1,5	1,9	—	—	—	NW, N. NE.	Mly.thick haze at day&ntdo
4	o,1	3,6	6,o	5,8	3,5	2,1	2,0	—	—	1,5oo	N. W. NE.	do.&clr nt. do.
5	1,9	4,9	5,7	10,5	3,3	1,9	1,9	—	—	—	W. NW. NE.	My th haze at da & nt do
6	2,4	5,2	11,5	8,4	5,4	3,5	2,4	—	—	—	NW. W. NESE.	My clr day & night dew do
7	2,7	6,2	7,8	—	6,5	3,2	2,7	—	—	—	W. S. W. NW.	do. do. do.
8	2,o	—	6,6	14,2	8,o	3,6	3,5	—	—	—	SW. W. NW.	do. do. do
9	2,o	5,2	7,8	—	5,2	3,1	2,1	—	—	—	N. NW. N.	Crear day &nightltg.&dew.
o	1,2	8,3	13,5	15,0	5,9	4,9	3,4	—	—	—	NW. N. W.	do. dc. do.
1	2,9	6,7	6,o	7,6	7,4	2,8	3,3	—	—	2,222	N NW. WE.	Mly. clr. day&nt.ltg.&dew.
2	2,5	8,9	6,4	9,3	1o,5	7,o	6,o	—	—	—	NW. NEE, SE.	Clear day & nt. ltng & dew.
3	3,5	8,8	6,5	8,0	9,	5,7	4,7	—	—	—	NW. W. E. SE.	do. do. do.
4	4,9	8,4	13,8	12,6	8,5	4,6	2,o	—	—	—	NW. W. NEE.	do. do, do.
5	4,o	—	6,8	7,3	3,7	1,6	1,4	—	—	—	NW. N. NE.	Clr.day&clr.nt. do, do.
6	o,8	4,5	4,6	5,2	3,8	3,5	3,9	—	—	—	E. SE.	Mly.cy.day&clr nt. do.
7	o,2	4,1	3,7	4,4	3,4	1,o	1,2	—	—	—	NE. E. NW.	Mly.cly.day&nt. do. &rain.
8	o,3	2,9	—	—	2,6	o,2	—	o,138	—	2,o35	N. NE.	do. thr. do. & hy.rn,
9	o,4	1,3	—	—	2,6	o,3	—	2,299	o,o96	—	NW. E. NE	Cloudy ltng. and rain.
0	o,9	1,0	—	—	o,5	o,1	—	—	o,451	—	NW. N. NE.	do thr. do.
1	o,8	0,8	o,o	1,8	1,1	o,5	—	o,052	o,o83	—	NW, N. NE.	do. do do.
n.	1,7	3,8	5,7	5,7	3,9	2,3	2,3					

Days.	Standard Barometer No. 3, by Gilbert.							Standard Barometer by Troughton.						
	Sun rise	10 P. M.	Noon.	2 P. M	Sun set.	8 P. M.	10 P. M.	Sun rise.	10 A. M.	Noon.	2 P. M.	Sun set.	8 P. M.	10 P. M.
Nov.	Inches													
1	30,0[illegible]0	30,050	30,0[illegible]8	29,982	29,996	30,034	——	74,9	79.[illegible]	[illegible]0.3	79.2	79.6	77.0	——
2	,000	,056	,0[illegible]8	,950	,960	30,0[illegible]	——	75.4	[illegible]0.5	81.0	82·0	[illegible]0.1	78.2	——
3	29,990	,020	29,994	,940	,926	29,956	——	75,8	77.	79.4	79.9	78.0	77.8	——
4	,9	29,93[illegible]	,9[illegible]0	,860	,840	,916	——	76,	75.0	76.5	77.0	76.7	76.2	——
5	,953	30,002	,95[illegible]	,90[illegible]	,908	,956	29,972	75,9	78.4	80.3	82.0	80.5	78.3	77.3
6	,966	,000	,958	,9[illegible]2	,924	,970	,982	74,5	78.9	82.0	83.0	80.4	77.9	77.9
7	,978	,026	,994	,95[illegible]	,9[illegible]2	30,022	30,036	75,9	80.2	81.4	83 4	8[illegible].9	79.0	78.0
8	30,040	——	30,070	30,052	30,070	.100	,100	7[illegible],5	——	84,0	83 7	8[illegible].0	81·4	78.3
9	,086	,140	,106	,060	,078	,104	,[illegible]06	76,0	80.7	82.8	83.2	80.7	79.0	77.5
10	,06[illegible]	,144	,108	,058	,070	,108	——	76,0	81.6	82.2	82.4	80.9	80.7	——
11	,100	,154	,104	,090	,124	,164	——	79.2	81.0	80.5	81.3	78 4	77,9	——
12	,150	,212	,182	,128	,127	,179	,180	78.7	81.3	81.8	81.0	79.0	77.9	79.2
13	,156	,200	,170	,134	,133	,179	——	74.2	80,4	80.4	79.4	77.5	77.8	——
14	,145	,[illegible]76	,146	,106	,121	.170	——	75.0	78.9	79[illegible]	80.0	77.2	76.9	——
15	,143	,177	,147	,096	,122	,166	,164	75.9	79.4	79.5	80.8	78.8	78.2	78.5
16	,154	,204	,180	,128	,123	,160	,174	74.1	78.8	79.9	80.6	78.8	78.2	78.2
17	,170	,210	,184	——	,152	,182	,190	76.2	79.4	78.8	——	78.7	78.0	78.6
18	,182	,202	,170	,122	,146	,170	,172	74.0	78.5	80.0	80.6	77.9	77 7	77.0
19	,154	,182	,170	,114	,110	,146	——	73.4	79.1	79.0	80.0	78.5	76.4	——
20	,156	,190	,160	,120	,132	,160	,156	75.8	79.6	79.7	78.7	77.9	77.2	77.0
21	,152	,192	,170	,126	,146	,178	——	76.2	76.8	79.2	79.9	77.2	76.3	——
22	,164	——	,200	,164	,178	,190	,205	73.8	——	80.0	80.4	78.8	77.2	76.8
23	,17[illegible]	,222	,187	,150	,162	,182	,182	73.1	79.0	80.3	80.4	77.6	76.8	76.4
24	,18[illegible]	,224	,204	,152	,162	,195	,196	74.0	79.6	8[illegible],4	80.3	77.9	77.1	76.4
25	,174	,202	,192	,150	,168	,198	——	72.0	78.9	79.4	80.4	78.7	76.3	——
26	,174	,204	,178	,150	,160	,180	——	77.9	77.9	81.0	80.7	78.9	78.0	——
27	,176	,2[illegible]4	,192	,158	,146	,188	,180	76.5	80.0	80.4	80.1	78.4	77.4	77.7
28	,166	,208	,180	,128	,126	,160	,146	75.4	78.0	79.0	79.1	75 9	74.1	74.9
29	,1[illegible]6	,190	,138	,088	,078	,1[illegible]8	——	71.0	77.2	77.3	77.9	76.0	75.3	——
30	,114	,[illegible]54	,136	,090	,088	,142	——	74.0	72.8	72.5	74 0	74.0	73.5	——
Mean	30,105	30,146	30,118	30,071	30,082	30,120	30,134	75,3	78.9	80.0	80.4	78.5	77.5	77.5

	Dep. of wet bulb. Therm.							Rain.		Evaporation	Winds.	Remarks.
	Sun rise.	0 A. M.	Noon	2 P. M.	Sun set.	8 P. M.	10 P. M.	Sun rise.	Sun set.			
1	·0,2	0,1	,3	ʼ,2	1,3	0,0	—	2,708	0,340	—	N.W.N.N.E	Cloudy thr. ltng. and rain.
2	0,5	2,2	3,0	3,5	2,1	0,3	—	0,104	—	—	N.NE.NW.	Mly.cly.day.&nt.th.ltng. &
3	0,0	0,6	1,4	4,ʼ	2,1	3,3	—	1,673	—	—	N.NW.	Cloudy. [heavy rain.
4	-5,1	3,0	4,5	4,7	2,7	2,2	—	—	—	ʼ.139	NW.W.	Cloudy.
5	4,	6,4	6,8	8,ʼ	5,0	4,3	4,5	—	—	—	SW.W.SW	Mly.clr.day&night ltg.dew.
6	3,7	8,1	0,3	7,4	4,2	2,3	1,9	—	—	—	W.N.W.E	do. do. do.
7	1,7	5,9	5,4	7,0	3,9	2,ʼ	ʼ,8	—	—	—	W.N.W	do. do. heavy dew.
8	2,5	—	—	4,7	3,5	3,0	0,5	—	—	—	NW N.NEESE	do. do do.
9	0,7	3,ʼ	5,3	5,5	3,1	2,0	0,5	—	—	—	N.NW.NE	do. do. do.
0	·0,2	3,4	4,2	4,4	2,9	2,7	—	—	—	—	NE.NE	Mly cly.day &nt.ltg.&rain.
1	·1,4	2,2	2,5	2,3	2,0	2,3	—	0,056	0,ʼ77	ʼ.938	N.E.E.NE	do. do. do.
2	0,7	5,0	5,8	5,0	4,6	3,9	3,7	—	—	—	NE.E	do. do.
3	2,2	4,4	6,4	5,6	4,5	3,5	—	—	—	—	N.NE.N	do. do.
4	,0	2,7	1,8	3,2	0,4	0,9	—	—	0,312	—	NE.N	do· do. & rain.
5	0,2	0,4	1,3	2,1	0,8	0,4	0,6	0,861	0 347	—	N.NE.E	do. do. do.
6	ʼ0,	ʼ,7	1,9	2,8	1,8	1,9	2,2	0,746	0,010	—	NW.NE.N	Mly.cly.day &clr. night do.
7	0,2	,7	1,3	—	2,3	ʼ,6	2,3	—	—	—	N.N.E	do. & night heavy rain.
8	0,0	1,5	0,7	4,6	3,9	2,9	2,5	0.799	—	ʼ.483	N.N.E	do. do. dew.
9	1,2	5,0	5,7	5,2	3,3	0,6	—	—	—	—	NE.NE	My.cy.d.&nt.th.lg.&hy rain
0	1,4	2,7	3,5	2,7	2,5	2,7	3,0	0,903	0.104	—	SE.N NE	do. & clr. night & rain.
1	3,2	0,9	1,2	,9	ʼ,2	0,8	—	—	0.472	—	N.NE.E	do clear nt. ltng.
2	0,8	—	4,8	5,7	4,9	4,2	3,3	0,132	—	—	NE.E	Mly. cly. day & clr. nt. dew.
3	1,1	3,2	6,3	5,6	3,8	3,8	3,4	—	—	—	NE.E	Mly.clr.day and night do.
4	2,2	2,6	5,7	6,5	5,6	5,	5,2	—	—	ʼ.785	NE.N	M.y. cly. day & clr. nt. dew.
5	3,3	7,ʼ	6,8	6,2	2,9	1,0	—	0.451	0,681	—	NE.N	do. & night rain.
6	2,1	1,6	4,2	3,9	2,6	2,0	—	—	—	—	NE E	do. do. dew.
7	3,1	4,9	5,4	5,7	4,4	4,ʼ	4,2	—	—	—	NE.E	do. and clr. night dew.
8	2,4	7,3	3,0	5,	4,9	3,1	2.9	—	—	—	NW.NE.N	Mly clr day and cly night
9	2,2	5,2	5,3	5,6	3,2	3,2	—	0,008	—	—	NW.N.NE	Cloudy aud rain
0	3,1	0,9	0,3	0,0	0,ʼ	+0,2	—	—	—	—	NW.N	do
	1,6	3,2	3,7	4,4	3,0	2,2	2 7			—		

The instruments with which the foregoing observations have been made, are placed upon a table about 4 feet above the ground in the western verandah of the Honorable Company's Observatory; which is situated in the longitude *5h. 21m. 9s.* E. latitude *13h. 4m. 9s.* N. at about two miles from the sea and about 27 feet above the low water mark.

T. G. TAYLOR,
H. C. Astronomer.

17th September, 1835.

ERRATA.

By an error of the press, the calculation in the article on estimating distances at Sea, at pages 340 and 341, volume 2d, has been rendered confused and unintelligible.—It should have been as follows:—

$$e = 2_o\ 4'\ 25''$$
$$4'\ 25'' = \text{apparent dip.}$$

cotang 2° 0' 0" = 11.45792

				3000	
				141	
3000	=	3.47712		2859	= 3.45621
		11.45692			11.55692
		4.93404			4.91313
		&c. &c.			&c. &c.